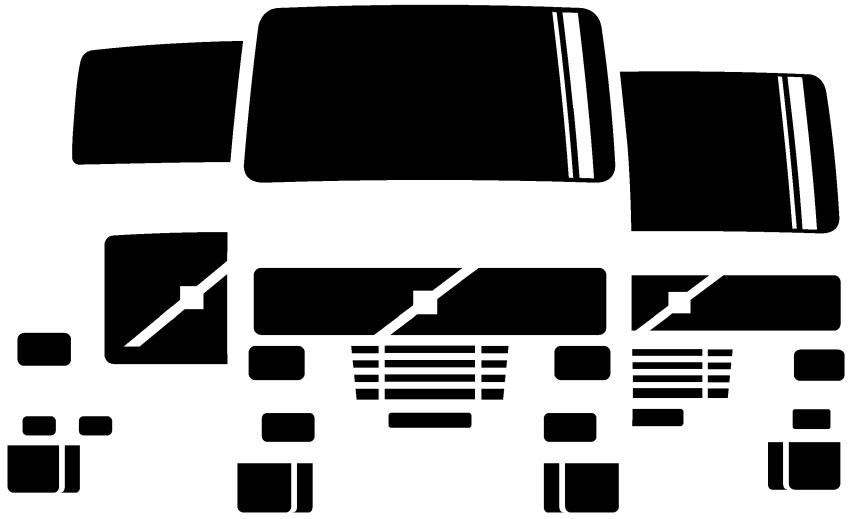
Service Manual
Trucks

Group **17**
Release **07**

Preventive maintenance
Annual service
FM, FH, NH

VERSION2



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VOLVO

Foreword

The descriptions and service procedures contained in this manual are based on designs and methods studies carried out up to October 05.

The products are under continuous development. Vehicles and components produced after the above date may therefore have different specifications and repair methods. When this is judged to have a significant bearing on this manual, supplementary service bulletins will be issued to cover the changes.

The new edition of this manual will update the changes.

In service procedures where the title incorporates an operation number, this is a reference to V.S.T. (Volvo Standard Times).

Service procedures which do not include an operation number in the title are for general information and no reference is made to V.S.T.

The following levels of observations, cautions and warnings are used in this Service Documentation:

Note: Indicates a procedure, practice, or condition that must be followed in order to have the vehicle or component function in the manner intended.

Caution: Indicates an unsafe practice where damage to the product could occur.

Warning: Indicates an unsafe practice where personal injury or severe damage to the product could occur.

Danger: Indicates an unsafe practice where serious personal injury or death could occur.

Volvo Truck Corporation
Göteborg, Sweden

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Feedback

Annual service

General, preventive maintenance

Volvo's preventive maintenance consists of:

Driver service	Done by the driver every day and during refuelling, please refer to the service manual in the vehicle binder.
Basic service	To be carried out at every engine oil and filter change or every 6th month, whichever occurs first.
Annual service	Done at least once a year.
Optional	Additions to the basic service and annual service that consist of simple checks the owner can do himself, but which can be ordered in conjunction with basic or annual service.
Additional procedures	These are best done at the same time as basic service or annual service The procedures are summarised in the service manual "Additional procedures" group 17.
Lubrication service	Lubrication service as per lubrication diagram for respective vehicle, group 175, conducted in conjunction with basic and full service, and also when intermediate lubrication is necessary.

There are report sheets for basic service, annual service and options.

Note: Lubrication intervals for chassis and cab, and change intervals for oil, filters and fluids, see Service Information group 175, "Lubrication service and oil changes".

Since operating conditions can vary depending on how the vehicle is used, it is important that the service workshop and the customer agree about the service needed for the vehicle.

Superstructure and trailer maintenance should be adapted to suit other service work in order to keep the number of service occasions to a minimum.

Vehicles driven on wet road surfaces with salt and sand as well as vehicles washed with high-pressure jets require more lubricating service.

We recommend washing the chassis in conjunction with annual service when the entire vehicle is inspected in order to facilitate inspection and repair during the servicing.

The illustrations in this service information show components in one truck variant. However, it is not possible to show all components.

WARNING

Put chocks under a wheel, so that the truck cannot start moving during service work.

Driver's service, optional

17725-3
Driver's service, optional

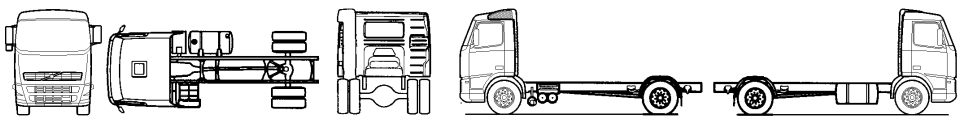
Preventive maintenance

Options schedule- FM, FH, NH VERSION2

Date	Name	Reg.no.
Mileage	Address	Telephone no.
Job order no.	Postal address	Delivery date
Executed by (signature)	Chassis type/no.	Engine type/no.
	Gearbox	Customer no.
	Final drive	

X Rectified without comment 1 Action recommended 2 Rectify immediately - Not applicable

Check all indication lamps in switches		
Check ignition switch function and fixing		
Check starter motor function and assess speed and sound		
Check function of all instruments		
Check function of all controls and switches		
Check seat adjustment		
Check seat belt condition and function		
Check condition of seats and bunks		
Check fire extinguisher condition and fixing		
Check window condition		
Check function of window lifts		
Check condition of floors, matting and steps		
Check function and sealing of roof hatch and engine casing		
Check function of storage bin locks and closing devices		
Check the sun shade and interior sun visor		
Test and check all internal lamps and horn		
Check registration plate condition and attachment		
Check condition and fixing of mudguards and mud flaps		
Check tyre tread depth		
Check tyre pressure and valve caps		
Check paint and panels for damage		
Check rear-view mirrors		
Check function of wipers and washers		



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Annual service

Annual service including lubrication and oil change– FM, FH, NH VERSION2

17746-2 Report for annual service – FM, FH, NH VERSION2

Date	Name	Reg.no.
Mileage	Address	Telephone no.
Job order no.	Postal address	Delivery date
Executed by (signature)	Chassis type/no.	Engine type/no.
	Gearbox	Customer no.
	Final drive	

X Rectified without comment 1 Action recommended 2 Rectify immediately - Not applicable

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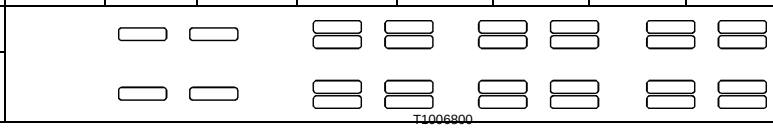
Battery status

Battery	Test code
Front/internal battery	
Rear/external battery	

←Note the values starting from the cab and moving rearward in the boxes below ←										
Brake linings - measured thickness in mm	Right									
	Left									
Brake levers - measured travel in mm	Right									
	Left									
Comments on tyre wear pattern	Right									
	Left									

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Adjustments and repairs to be conducted immediately to a maximum amount of _____. If this limit is exceeded, the customer must be contacted.
The following has been pointed out by the customer. The driver's report must be attached.

No.	Action - description

17746-2
Annual service

Annual serice including lubrication, oil and filter change in engine, oil change in bogie lift, filter change in power steering, oil and fluid level check

During oil changes, it is of the greatest importance to ensure that as much oil as possible is drained and changed. For this reason, remember that oil changes are best done after driving, i.e. when the oil is warm.

When changing the oil, the oil filters should also be changed. The old oil filters should always be scrapped. Always check the oil level after topping up.

⚠ WARNING

Hot oil can cause burns. Use protective gloves.

For information about oil change volumes, oil and grease grades, viscosity and oil change intervals, please refer to the service information “Lubrication service and oil changes” group 175.

För protokoll se “Annual service” page 4.

1 Chassis lubrication

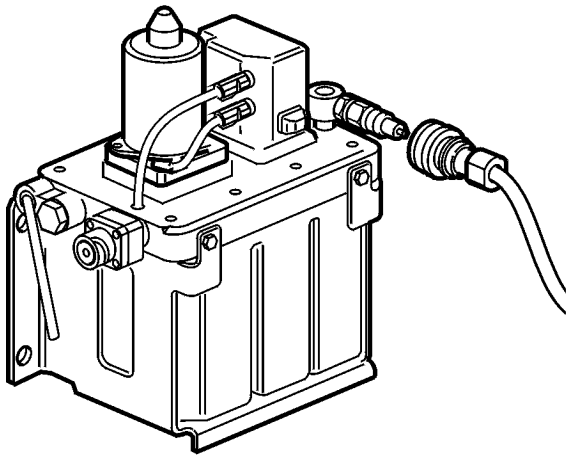
1

- Lubricate in accordance with each vehicle’s **lubrication chart**. Please refer to the service information, group 175.

  1 **Grease nipple** locations are given in the lubrication chart. Always ensure that each lubrication point is properly lubricated. Apply grease until new grease is forced out and becomes visible. If no grease is forced out, there is a fault somewhere, and action must be taken at once.

  2 The parking brake on vehicles with drum brakes must be released when lubricating so that grease can enter freely to the brake cams.

- Vehicles with central lubrication:



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Check if grease needs to be topped up in the grease reservoir, and top up as necessary.

To top up with lubricant, remove the lid on the pump. Then remove the protective cap from the filling valve and pump lubricant in, using female union 9808639, until the level reaches the max marking.

Note: It is of extreme importance that the correct equipment and the correct quality of grease are used when filling so that dirt does not contaminate the grease

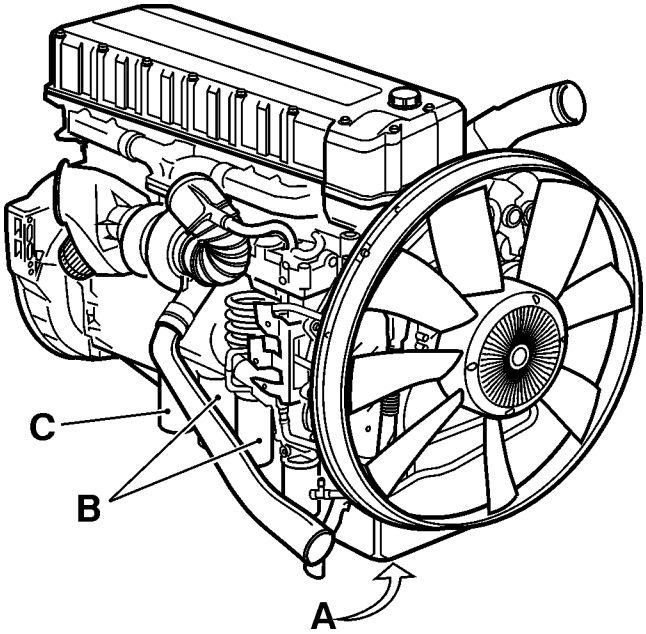
For information about lubricant quality, see service information “Lubrication service and oil changes” group 175.

2 Cab lubrication

1
Lubricate in accordance with each vehicle's **lubrication chart**. Please refer to the service information, group 175.

3 Change engine oil and filter

1
The drain plug (A) is located at the bottom of the oil pan. Drain off the oil after driving when it is still fluid. Replace the full-flow filter (B) and the bypass filter (C) at the same time as the oil is changed.



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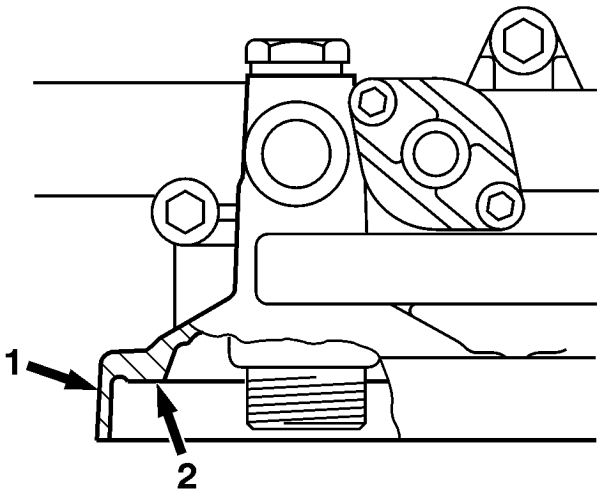
CAUTION

Hot oil can cause burns. Take care to avoid spilling oil when topping up. Oil spilt on the engine can affect cooling performance.

- Remove any sound baffles underneath the engine.
- Clean around the drain plug.
- Remove the drain plug. Use torque wrench to turn the drain plug, see service information group 21 for more information.
- Drain the oil.
- Clean the filters and filter brackets externally to prevent dirt form entering when the new filters are fitted.
- Undo the existing oil filters with tool 9998487 and dispose of them. The oil filters are of the disposable type and shall always be thrown away after use.

Note: The filters must not be cleaned, replacement is the only measure that may be taken. Always replace the filters when the oil is changed.

- Clean the sealing surface (2) for the oil filter seal and the surrounding surfaces on the filter bracket thoroughly.



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- If the oil filter brackets have a protective lip (1) for the oil filter, the inside of the protective lip must also be cleaned thoroughly.
- Apply a thin film of oil to the rubber seals on the new oil filters.
- Screw on the oil filters by hand until the rubber seals just touch the sealing surfaces.
- Then turn an additional 3/4 to one complete turn (or as specified by the marking on the filter).
- Check the oil filling system and oil stick.
- Put back the drain plug with a new gasket and fill up with new oil. Use the side filler on the engine to fill with oil.

- Put back the sound baffles underneath the engine if previously removed.

For information about oil grades, oil change volume and oil change intervals, please refer to the service information “Lubrication service and oil changes” group 175.

Oil level check

1
Note: Under no circumstances may the level fall below the lower marking. Neither should the level be above the upper mark on the dipstick.

- Check that the oil level reaches the upper half of the distance between max and min on the dipstick.
- Start the engine and make sure that there is no oil leakage.
- Stop the engine and check the oil level after a few minutes. Top up as necessary.

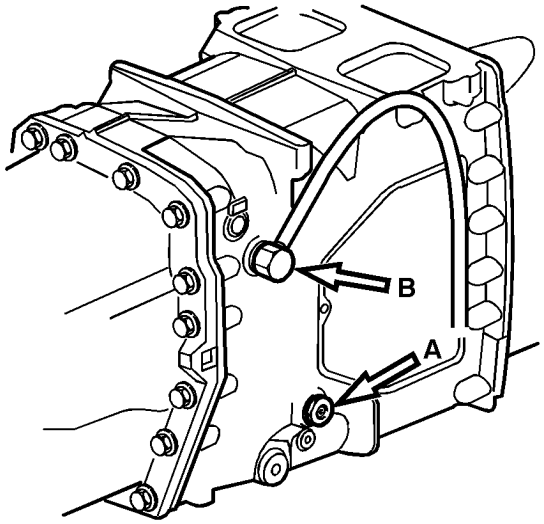
4 Check oil level in manual gearbox

1
Note: If, depending on the gearbox’s service interval, the oil and filters on the gearbox are to be changed, see **Additional procedures, op no. 17523-3**.

- Remove the sound baffle underneath the gearbox if fitted.
- Check that the oil level is between the centre and the maximum level on the transparent level plug in the gearbox (A) (maximum and minimum oil level, see picture)

Note: Do not unscrew the transparent level plug.

- Top up with oil as necessary, but first clean round the filler plug (B).
- Remove the air vent hose from the filler plug (B) and unscrew the plug.
- Fill the gearbox with oil until the level is between the middle and maximum level on the transparent level plug (A). (Maximum and minimum oil level, see picture)



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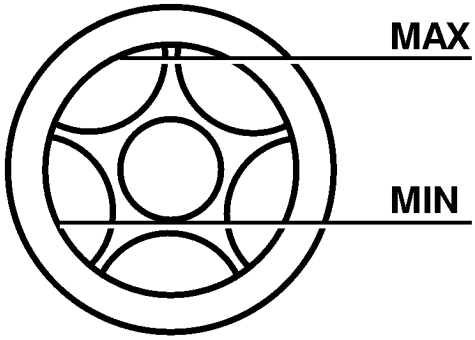

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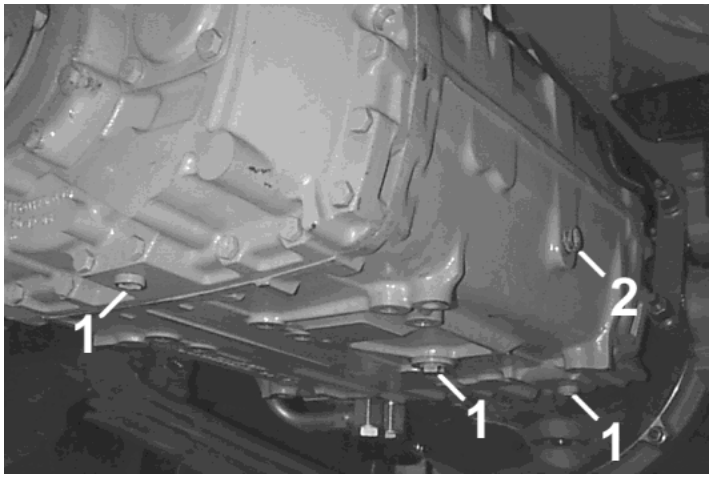
For information about restoring the oil level in the gearbox, please refer to the service information “Lubrication service and oil changes” group 175.

- Apply a layer of thread sealant to the threads of the filler plug (B) and screw the plug on. The tube on the plug must have the same position **diagonally upwards**, as before removal.
- Install the air vent hose.
- Refit any sound baffles under the gearbox.

For information about oil grades, please refer to the service information “Lubrication service and oil changes” group 175.

ZF gearbox

1



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1 Drain plugs

2 Filler plug

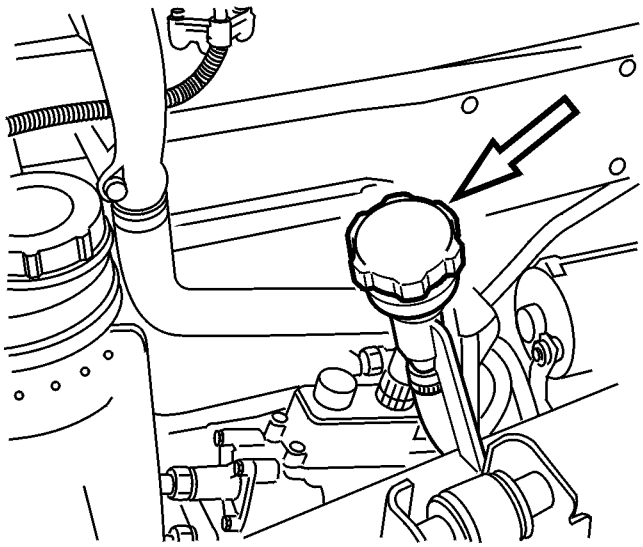
- Unscrew the filler plug (2) and check that the oil level reaches up to the edge of the filler hole.
- Top up with oil if necessary.

For information about oil grades, oil change volume and oil change intervals, please refer to the service information “Lubrication service and oil changes” group 175.

5 Check oil level in automatic transmission

1

Note: If, depending on the gearbox’s service interval, the oil and filters on the gearbox are to be changed, see **Additional procedures, op no. 17523-3**.



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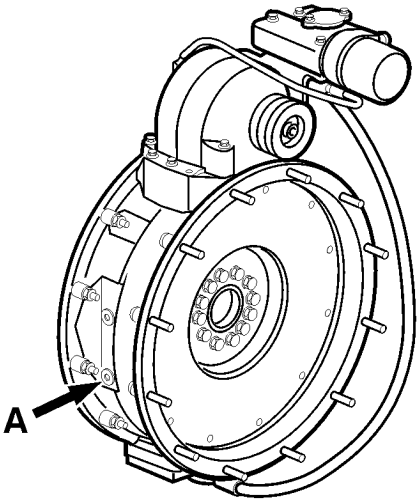
Check the oil level when the gearbox is at operating temperature, **70-90°C**, to ensure that the oil level is correct.

VT1705PT, VT1706PT, VT1906PT, VT2206PT

- Clean round the oil filler cap and dipstick.
- Apply the parking brake and start the engine.
- Move the gear selector between forward and reverse, and stop for a few seconds in each gear position.
- Put the gear selector in neutral with the engine running at about 1000 rpm.
- Wipe the dipstick on a clean lint-free paper.
- Check the oil level with the dipstick and top up with the correct grade of oil as necessary.

For information about oil grades, please refer to the service information “Lubrication service and oil changes” group 175.



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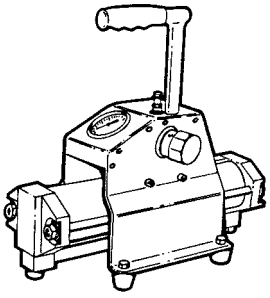
6 Check oil level in power take-off (flywheel mounted)

1

Note: If, depending on the PTO's service interval, the oil and filter is to be changed on the PTO, see **Additional procedures, op no. 17577-3**.

- Clean round the level/filler plug (A).
- Remove the level/filler plug (A) and check that the oil level reaches up to the edge of the filling hole.
- Top up with oil if necessary.
- If the level/filler plug's sealing ring is damaged it should be replaced.

For information about oil grades, please refer to the service information "Lubrication service and oil changes" group 175.



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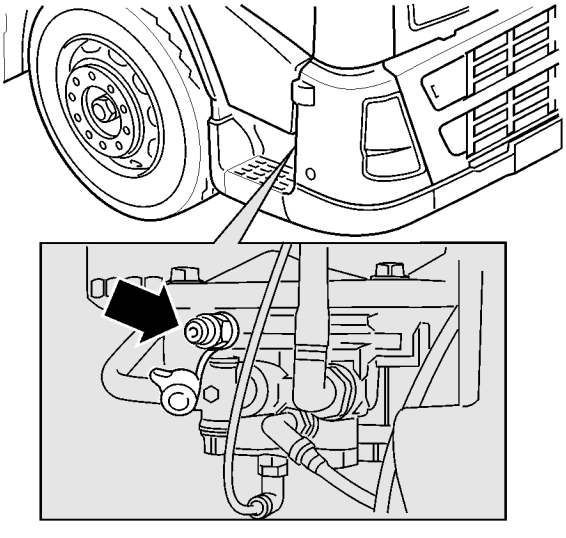

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7 Check oil level in retarder

1

The oil level in the retarder normally only needs to be checked when there is a problem with the retarder, such as low braking torque, oil leakage or in certain cases when an oil change has been done on the retarder.

Note: If, depending on retarder's service interval, the oil is to be changed in the retarder, see **Additional procedures, op no. 17528-3**.

Check the level of oil in the retarder when it is at operating temperature to ensure that the oil level in the retarder is correct.

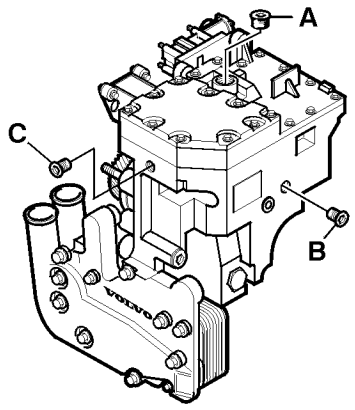
The vehicle must be standing horizontally.

Note: It is important for retarder function that the oil level is correct.

The pneumatic system must be charged. An alternative to filling the system by starting the engine can be to use a pressure booster 9810621

If the pneumatic system is charged from an external source of compressed air, it should be done through the air drier charging nipple to prevent moisture entering the pneumatic system.

- Put the starter key in the drive position. Engage the retarder fully for at least 3 seconds. Disengage the retarder. Repeat this procedure two more times. Put the starter key in the 0 position. Wait 5 minutes before checking the oil level.



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WARNING

The retarder must be disengaged when you check the oil level. Otherwise, hot oil can be forced out of the retarder and cause burns. Use protective gloves.

Clean round the oil level plug (B).

- Remove oil level plug (B) and check that the oil level reaches up to the edge of the filling hole.
- If the retarder needs to be topped up with oil, clean round the oil filler plug (A) and ventilation plug (C). Unscrew the plugs.
- Fill oil carefully through the oil filling hole (A), so that the retarder has time to ventilate through the ventilation duct (C). Fill up with oil until the level reaches the edge of the oil level hole (B).
- Install the oil filler plug (B) and ventilation plug (C). Tighten the plugs to 20 Nm. If any of the plugs' sealing rings are damaged they should be replaced.
- Install filler plug (A). Tighten the plug to 70 Nm. If the sealing ring is damaged it must be replaced.

For information about oil grades, please refer to the service information "Lubrication service and oil changes" group 175.

8 Check oil level in transfer gearbox

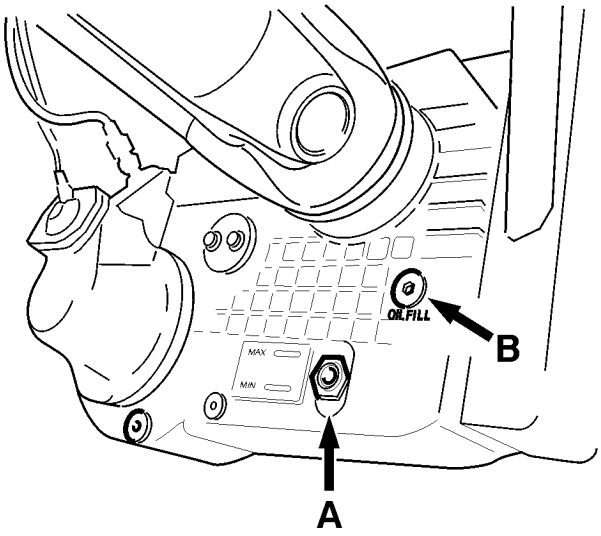
1

Note: If an oil change is to be done on a transfer box, depending on the transfer box service interval, please refer to **Additional procedures, op no. 17530-3**.

- Check that the oil level is between the middle and maximum level on the transparent level plug of the transfer gearbox (A). (maximum and minimum oil level, see picture.)

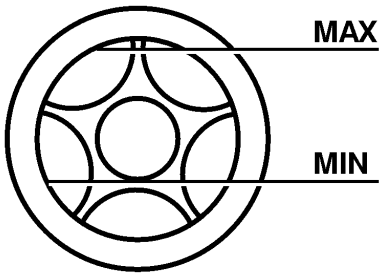
Note: Do not undo the transparent level plug.

- Top up with oil as necessary, but first clean round the filler plug (B).



T1007655

- Unscrew the filler plug (B) and top up with oil until the oil level is between the middle and the maximum level on the transparent level plug (A). (maximum and minimum oil level, see picture.)



T1007661

For information about restoring the oil level in the gearbox, please refer to the service information “Lubrication service and oil changes” group 175.

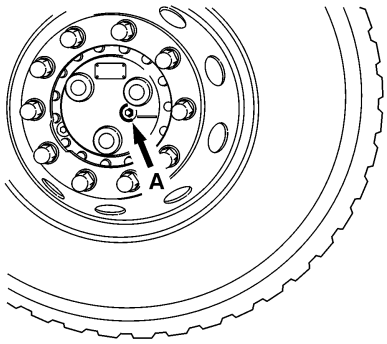
- Refit the filler plug (B). If the seal ring on the plug is damaged, change the seal ring.

For information about oil grades, please refer to the service information “Lubrication service and oil changes” group 175.

9 Check oil level in driven front axle

1

Note: If an oil and filter change needs to be done on the driven front axle, depending on the driven front axle service interval, please refer to **Additional procedures, op no. 17582-3**.



T1007657

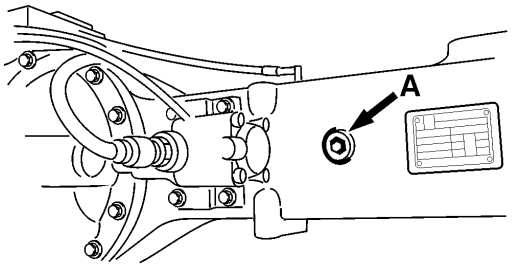
Front axle wheel gears

The front axle should be raised.

- Clean around the level/filler plugs (A) for the wheel gears.
- Turn the wheel so that the level mark by the level/filling hole is horizontal.
- Remove the level/filler plug and check that the oil level reaches up to the edge of the filling hole.
- Top up with oil if necessary.
- Install the level/filler plugs for the wheel gears. If a seal ring on any of the plugs is damaged, the seal ring must be changed.

Front axle differential carrier

- Clean round the level/filler plug (A).



T1007658

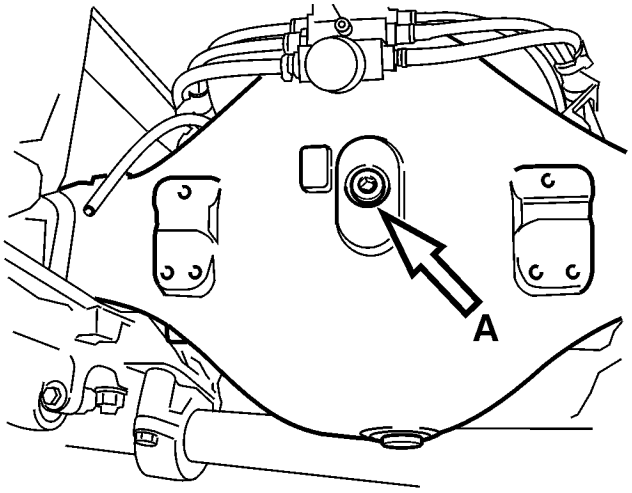
- Remove the level/filler plug (A) and check that the oil level reaches up to the edge of the filling hole.
- Top up with oil if necessary.

For information about topping up the oil level in the driven front axle, please refer to the service information “Lubrication service and oil changes” group 175.

- Fit the level/filler plug (A).

If the filler plug has a seal washer, the seal washer must be changed.

For information about oil grades, please refer to the service information “Lubrication service and oil changes” group 175.



T1007418

10 Check oil level in rear axle

1
Note: If the oil in the rear axle needs to be changed, depending on the rear axle service interval, please refer to **Additional procedures, op no. 17527-3 or 17561-3**.

If there is any oil leakage from the rear axle and/or hub reduction hubs, or if there is any doubt about the rear axle oil level, check as follows:

The bogie must be lowered.

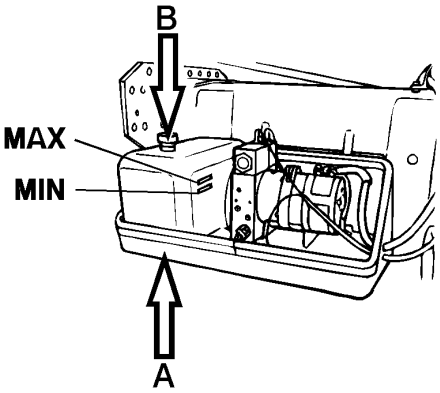
- Clean round the level/filler plug (A).
- Remove the level/filler plug (A) and check that the oil level reaches up to the edge of the filling hole.
- Top up with oil if necessary.

For information about topping up the oil level in the rear axle, please refer to the service information “Lubrication service and oil changes” group 175.

- Fit the level/filler plug (A).

If the filler plug has a seal washer, the seal washer must be changed.

For information about oil grades, please refer to the service information “Lubrication service and oil changes” group 175.



T1006404

11 Oil change in hydraulic bogie lift

1
The bogie wheels must be lowered and the bogie lift moved to the end position.

- Remove the drain plug (A) and drain the oil. Remove the filler plug (B) to facilitate draining.
- Fit the drain plug and fill up with oil. The oil level must be between the markings on the oil reservoir.
- Fit the filler plug.

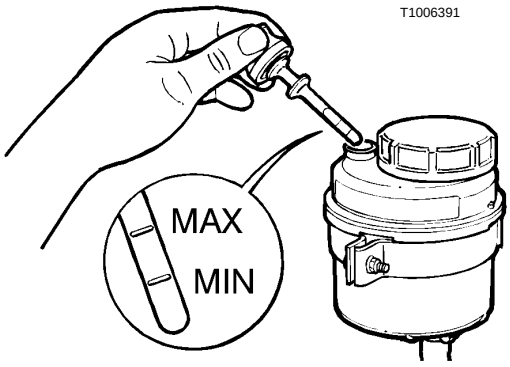
For information on oil quality and oil change volume, see service information “Lubrication service and oil changes” group 175.

12 Filter change in power steering

1

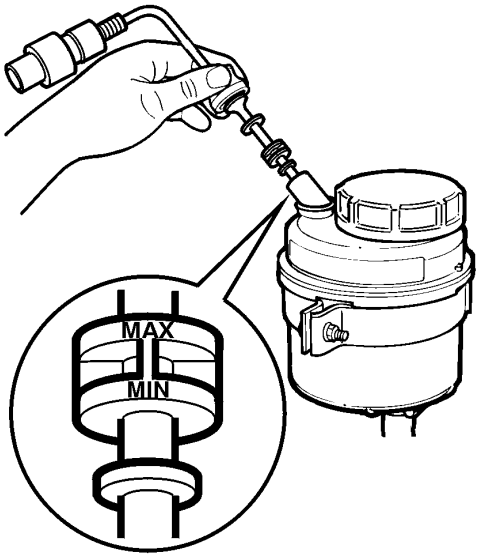
T1006391

- Clean round the cap and the dipstick before the cap is removed.
- Press down and unscrew the locking device for the filter.
- Lift up the old filter and keep one finger under the filter's centre hole, so that impurities from inside the filter do not enter the oil reservoir.
- Transfer the locking device to the new filter and insert it into the oil reservoir.
- Check that the filter is positioned correctly and is locked in place securely.



T1006378

- Check the oil level and top up with oil to the MAX marking.



T6007837

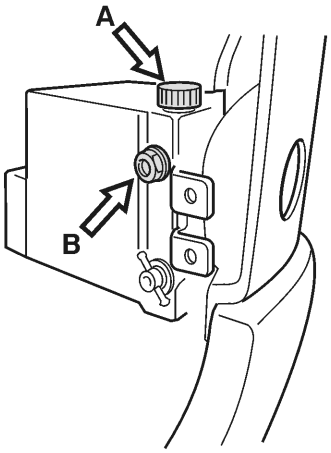
Oil dipstick in oil reservoir on vehicles with hydraulically steered pusher and trailing wheel axles:

Unplug the connector on the electrical cable to the dipstick. Check the oil level. With the engine stationary, the level should be on the MAX marking on the dipstick.

- Fit the cover.

Some vehicles with 2–circuit steering systems have twin oil reservoirs for the power steering.

For information about oil grades, please refer to the service information "Lubrication service and oil changes" group 175.



T1007364

13 Check oil level in cab tilt pump

1
Check the oil level with the cab in the drive position.

- In order to check the oil level in the cab tilting pump, the panel in front of the foot step must be unscrewed.
- Unscrew the filler plug (A), put the pump piston in the lower position.
- Check that the oil level for the cab tilting pump is in the centre of the level glass (B).
- Top up the oil when necessary and screw in the filler plug (A).

Note: Do not top up when cab is tilting up.

For information about oil grades, please refer to the service information “Lubrication service and oil changes” group 175.

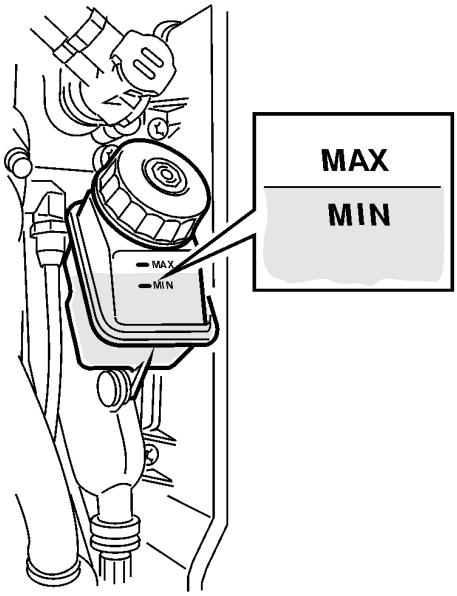
14 Check fluid level in clutch fluid reservoir

1

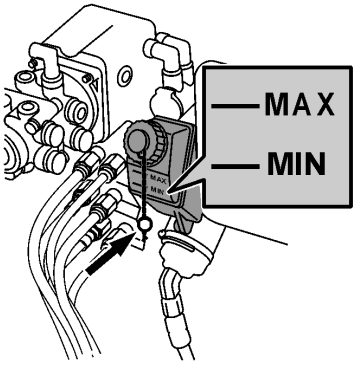
- Check that the level in the clutch fluid reservoir is in the centre of the reservoir, or between the MIN and MAX markings, if found.
- Top up with brake fluid in the reservoir as necessary.

Take care when topping up the fluid and check that the reservoir cap is securely tightened to prevent the fluid from running out and damaging the paintwork.

Note: For South American market, the reservoir has to be sealed, see pictures.

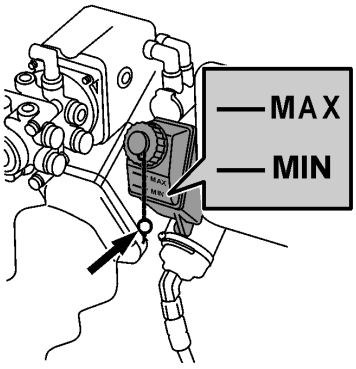


T1007731



C0002139

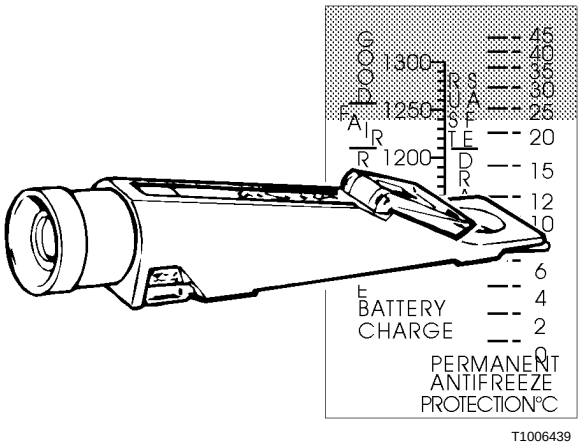
FM, FH, South American market



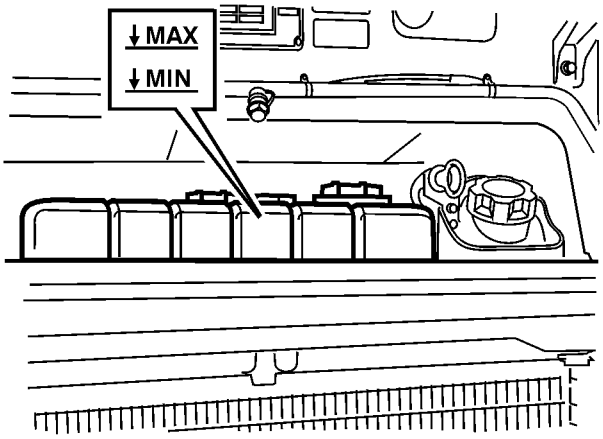
C0002140

NH, South American market

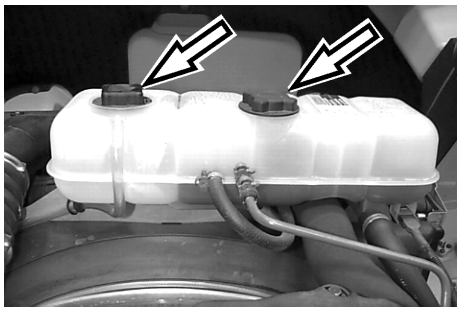
Note: It is **important** that the fluid has the correct grade, please refer to the service information “Lubrication service and oil changes” group 175.
Cleanliness is **important** when topping up the clutch fluid. The filling vessels must be **absolutely clean** and must not contain any traces of dirt or any type of mineral based grease or oil.



T1006439



T1007365



T1007465

15 Check coolant frost protection and fluid level

1

Note: If, depending on change interval for the coolant, the coolant is to be replaced, see **Additional procedures, op no. 26010–2**.

- Check coolant frost protection (= corrosion protection) with a hydrometer, 9985011. The frost protection must be between -25°C and -45°C.
- Top up with water and 50% concentrated coolant as necessary, mix before topping up. The fluid level must be between the MIN and MAX markings on the expansion tank when the engine is cold.

For information about water and coolant quality, please refer to the service information group 26.

Note: If the quality of the water does not fulfil the specifications, the ready-mixed coolant from Volvo should be used.

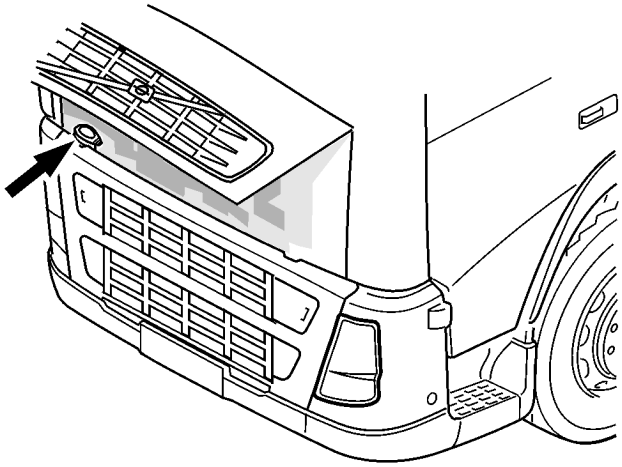
Use only Volvo approved concentrated coolant, which contains special corrosion inhibitors and is adapted to Volvo engines. Mixing with other types of concentrated coolant will result in inferior anti-corrosive properties and damage to the engine.

- Check that the filling and pressure caps are securely tightened by hand.

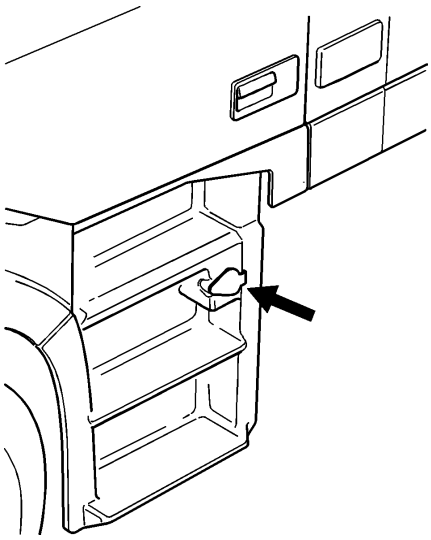
For information about coolant, please refer to the service information “Lubrication service and oil changes” group 175.

16 Check fluid levels in windscreen and headlamp washer reservoirs

1

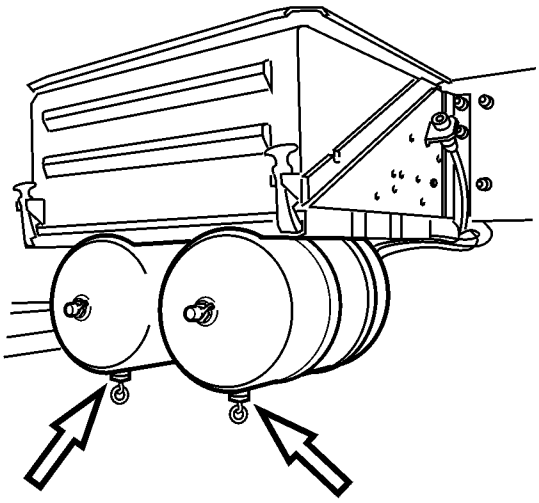


T1007366



C1000029

Top up with washer fluid as necessary.



T1007367

17 Check air drier

1

Note: If the drying agent has to be changed, depending on the air drier service interval, please refer to **Additional procedures**.

For information about the service interval for the air drier, please refer to the service information “Lubrication service and oil changes” Group 175

CAUTION

Follow the instructions carefully to avoid personal injury or damage to products or equipment.

Note: Check that the parking brake is applied.

- Drain off any condensation from the compressed air tanks.
- On vehicles with air driers there should be no water in the compressed air tanks.

If there is no water in the compressed air tanks this means that the air drier is functioning correctly.

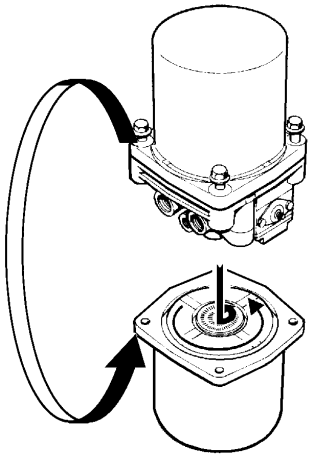
- Empty the compressed air tanks to make sure the pressure regulator cuts in. Start the engine and make sure **no** air leaks out from the silencer on the air drier when the compressor is charging.

If there is an air leak from the silencer on the air drier, use Service Information group 56 as a guide for rectifying the air drier.

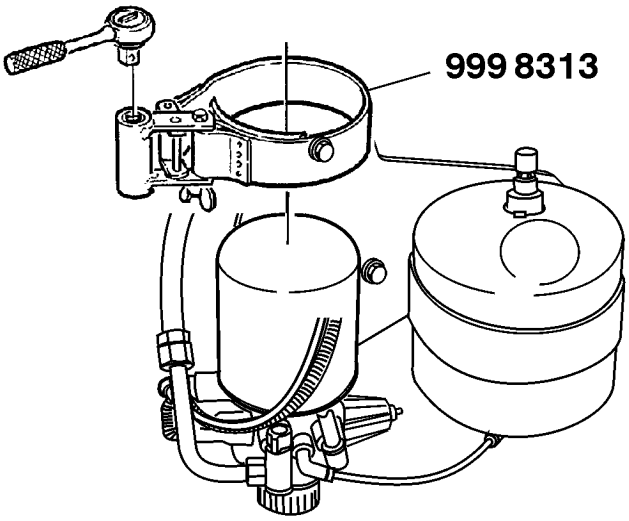
- Let the engine run until the pressure regulator disengages the compressor. Switch off the engine. After the regeneration tank has emptied, about 30 seconds, check that **no** air leaks out from the silencer on the air drier.

If there is an air leak from the silencer on the air drier, use Service Information group 56 as a guide for rectifying the air drier.

- Clean round the drying agent reservoir.
- Empty the air from the pneumatic system, use nipple 9992976.
- AIRDRY (HALDEX)
  1 Remove the four screws which hold the reservoir together with the drying agent reservoir.
  2 Lift off the reservoir together with the drier insert.



T5008850



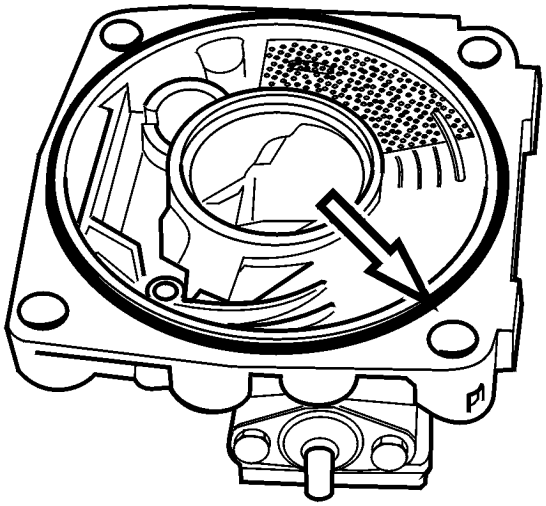
T5012025

- AIRDRY1, AIRDRY-E (WABCO)
  1 Unscrew the drying agent reservoir with a filter wrench 9998313 or 9999179.
- Check the air drier housing for carbon deposits.

Note: Note on the report if carbon deposits are present in the air drier housing.
If it is considered that carbon deposits could cause problems before the next service, see service information group 56 for checks and procedures.

In connection with these checks and procedures, the compressed air pressure drop should also be checked as in point 26 in Full Service, service information group 17.

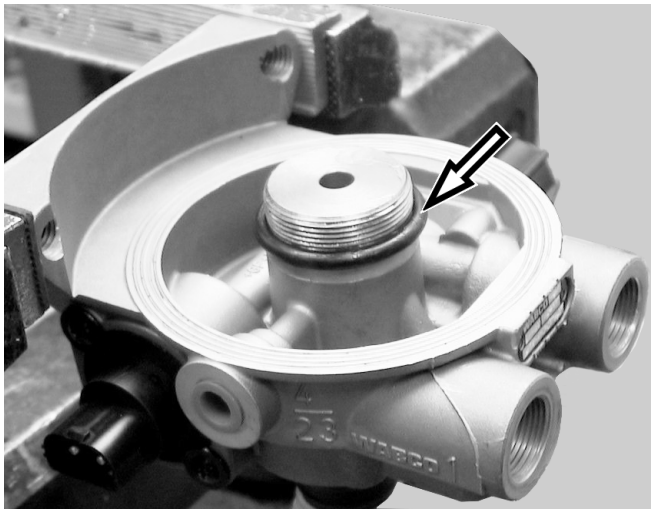
- AIRDRY (HALDEX)



1 Change the O ring, spread a thin layer of grease on the new O ring and put it in the housing.

2 Refit the existing reservoir with drying agent cartridge. Screw in the four fixing screws and tighten them crosswise. Tightening torque 45±2 Nm.

- AIRDRY1 (WABCO)



T5012026

1 Spread a thin layer of grease on the drying agent reservoir sealing ring and on the threaded pin.

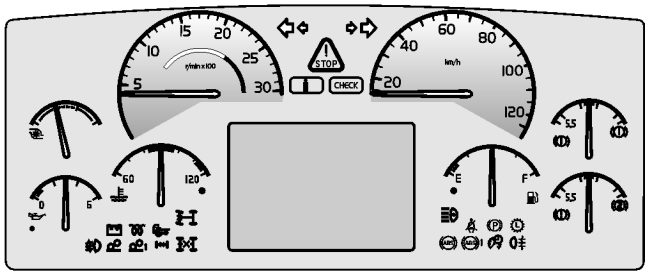
2 Screw on the reservoir by hand until the seal is against the air drier housing, then turn it approximately one more turn (approx. 15 Nm) by hand, or as the marking on the drying agent reservoir indicates.

- Start the engine, fill the compressed air system, check that there are **no** air leaks from the air drier.

For information about the service interval for the air drier, please refer to the service information “Lubrication service and oil changes” group 175.

Checks in cab

18 Check warning and control lamps



T1007735

1
Use the vehicle binder as a guide.

Instrument with large display.

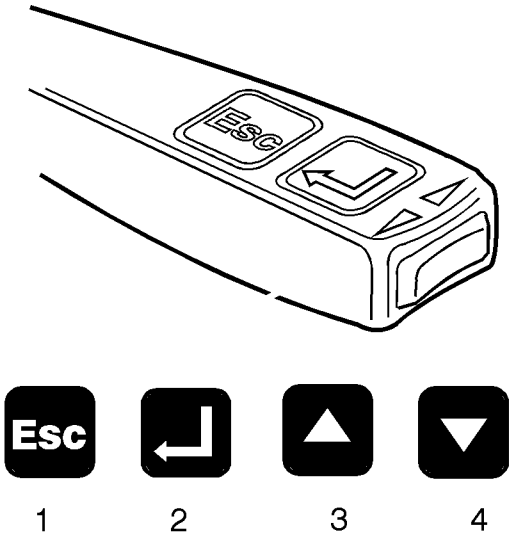
The engine must be switched off with the starter key in drive position.

Warning and control lamps are tested with the lever on the right-hand side of the steering wheel and the instrument display.

•

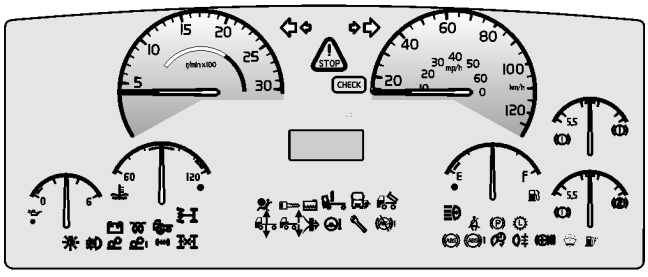
CONTROL LAMP TEST
GAUGE TEST
DISPLAY TEST
BUZZER TEST

Scroll to MENU: FAULT DIAGNOSIS/INSTRUMENT TEST/CONTROL LAMP TEST on the display.



- Press “SELECT” (2) when the marker on the display shows “CONTROL LAMP TEST”. The warning and control lamps on the display are turned on and off in 5 second intervals.

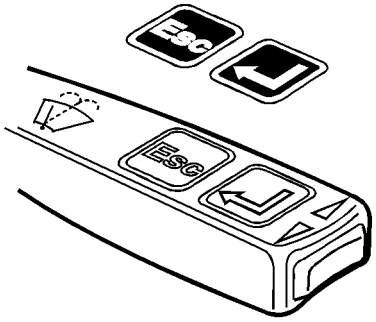
The test can be cancelled by pressing “Esc”



T1007698

- **Instrument with small display.**

In order to test warning and control lamps on this type of instrument, the motor must be switched off with the starter key in drive position. All warning and control lamps should then be illuminated.



T1006725

19 Check fault codes in the vehicle control units

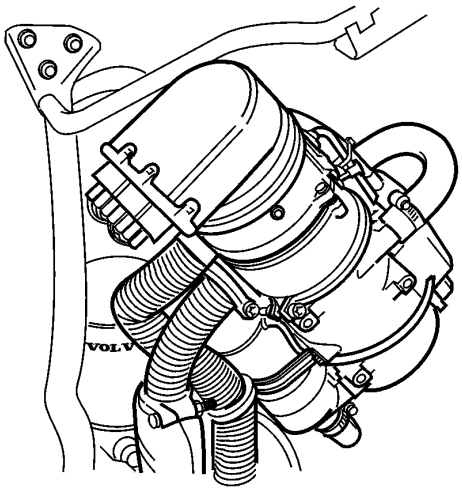
1
When testing, the engine should be switched off and the starter key should be in the driving position.

The lever on the right-hand side of the steering wheel is used for communication and checking any fault codes on the driver information display.

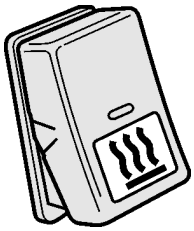
- Test with the help of control lever and display whether fault codes are stored in one of the control units of the vehicle.
- Make a note of the fault codes first and then rectify them.
- Zero the fault codes after action.

Fault codes can also be read with a PC through the diagnostics socket located under the dashboard on the driver's side of the vehicle.

Use service information group 03 as an aid.



T1007410



T8008457

20 Function check of parking heater

1
Use the Parking Heater User Manual as a guide.

- Start and run the parking heater for 15 minutes in order to check its function.

⚠ WARNING

Check the heater for blocked or leaking exhaust pipe.

Note: Do not stop the parking heater until it has been running for at least 15 minutes.

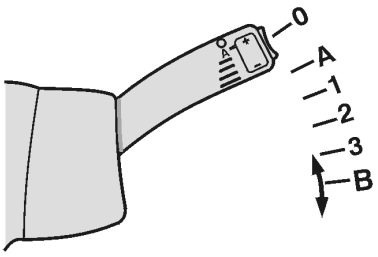
- If the heater malfunctions in any way, it should be checked and the fault rectified.

Note: Annual maintenance must be conducted in good time before the start of the heater season.

Use Service Literature, Group 87, as a guide.

Quick start/manual stop of parking heater

Quick start	Press once on the switch to start the parking heater
Manual stop	Press the switch once to turn off the parking heater.



T5012246

21 Check retarder control

1

- Check that the control steps are distinct and that the control remains in the set position.
- Check that the control springs back to bottom position.

22 Start of engine and check of starter element

1

Use the vehicle binder as a guide.

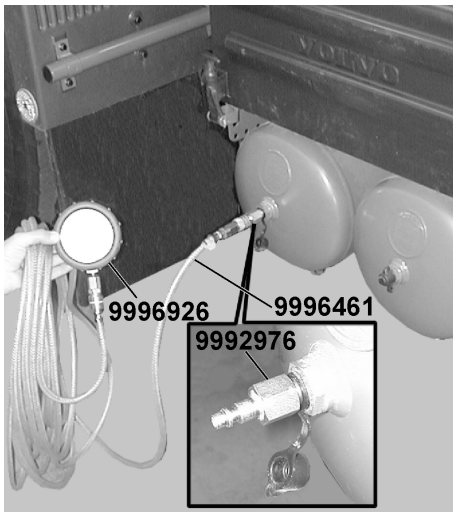
- Apply the parking brake.
- Check that the gear lever is in neutral.
- Turn the starter key to the preheating position.
- Check that the control lamp for the preheating lights up and the preheating starts.

T3008841

Automatic preheating will take place for a certain time on cold engines depending on the temperature of the coolant. The lamp will then go out. If the engine is warm, this only lasts a few seconds.

- Start the engine when the control lamp for the preheating goes out.

23 Check pressure regulator cut-out and cut-in pressure



C5001561

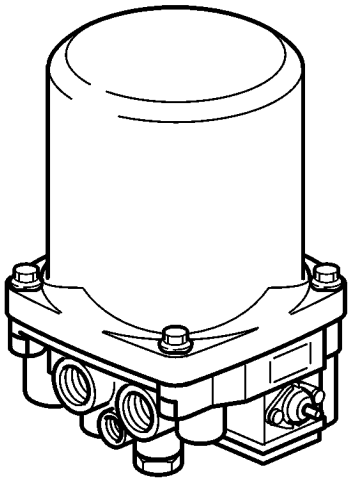
1

To avoid read errors on the vehicle's compressed air gauge when checking the pressure regulator cut-out and cut-in pressure for the compressor, manometer 9996926 and hose 9996461 and nipple 9992976 should be connected to the primary tank (wet tank) test outlet. If there is no primary tank, connect the manometer to one of the circuit tanks.

The pressure regulator is integrated into the braking system air drier.

The parking brake must be applied.

- Let the engine run at high idling speed to build up the pressure more quickly, until the pressure regulator disengages the compressor.

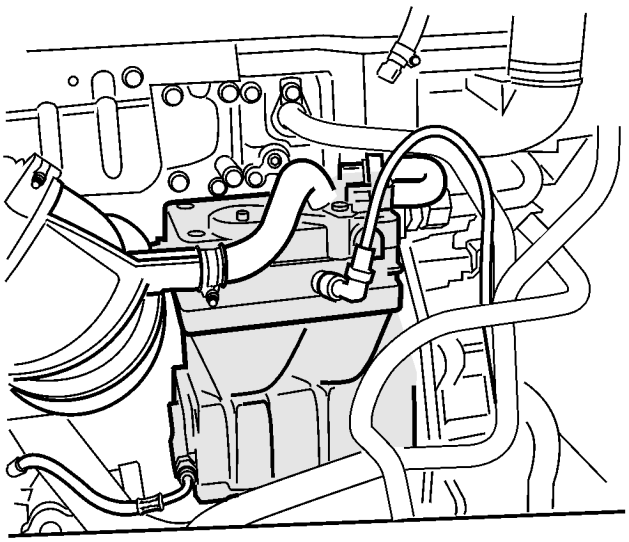


T1008214

- Lower the pressure in the compressed air tanks by applying the foot brake repeatedly until the pressure regulator engages the compressor again and starts to build up the pressure.
- When checking the pressure regulator cut-out and cut-in pressure, note the pressure readings on the manometer and the vehicle instrument, while listening to the compressor during the cut-out and cut-in of the pressure regulator.

If in doubt of the pressure regulator cut-in and cut-out pressure, see service information group 56.

24 Check compressor function and condition



T1007729

1

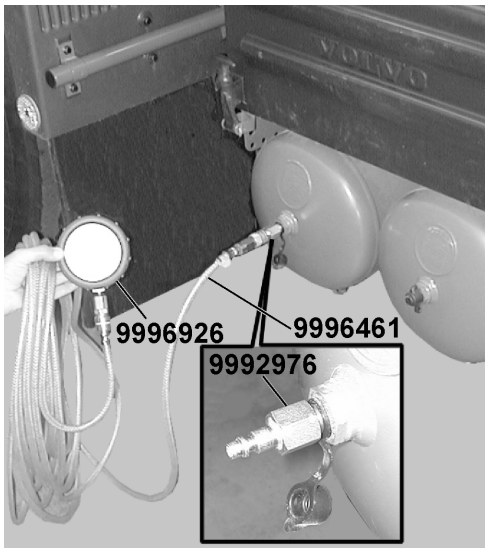
- Apply the parking brake.
- Run the engine at approx. 1000 rpm so that the compressor can build up the pressure in the compressed air system.
- Brake repeatedly so that the pressure in the brake circuit tanks drops below 2 bar.
- Check that the warning lamps for the main brake circuits light up at low service brake pressure. A signal is also heard when the engine is running.
- Check that the brake system charges up as normal.

For information on charging times for compressors, see service information group 56.

25 Check pressure drop in compressed air system

1
The check is best done with a standard trailer connected.

- Charge the pneumatic system.
  1 Vehicles with rear leaf suspension, at least 750 kPa (7.5 bar)
  2 Vehicles with rear air suspension or EBS, at least 1100 kPa (11.0 bar) (Japan, 9.8 bar)
- Stop the engine.
- The ignition key should be in the driving position.
- The parking brake should be released during the check.



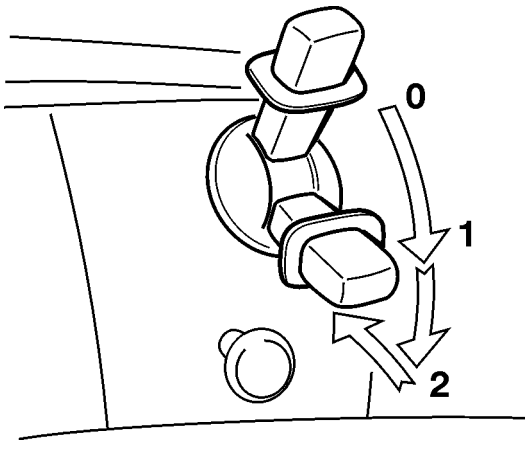
- Apply the foot brake with full pressure. Use a pedal jack.
- Pusher or trailing wheel axles should be lowered.
- The gear lever should be in neutral, the range gear should be in low gear and the splitter gear in high gear.

Note: Before checking a drop in pressure, let the vehicle stand for a few minutes so that the pressure can stabilise.

- On the manometer, check that the drop in pressure of the compressed air system does not exceed 20 kPa (0.2 bar) for a period of 5 minutes.
- Listen for possible air leakage.
- Disconnect the manometer with hose and nipple from the compressed air tank.

26 Check parking brake and blocking valve

1
The compressed air system must be charged.



T5012244

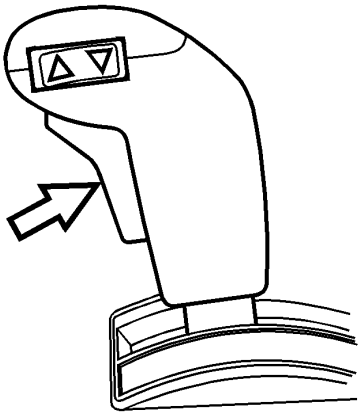
- Apply the parking brake.
- Check that the parking brake control has a noticeable locking position when applied.
- Check the parking brake by trying to pull away in high gear.
- Release the parking brake.
- The blocking valve should be depressed. Make sure the brake is released by pulling away with the vehicle.
- Lower the pressure in the brake system by applying and releasing the foot brake and the parking brake a number of times.
- Check that the button for the blocking valve pops out by itself and remains out.
- Check that the warning lamp for applied parking brake is working.

Note: The control button must not drop to depressed position by itself. This indicates a leaking valve.

27 Check gear shift linkage and clutch pedal

1
Use the User Manual for each vehicle as a guide.

Check of gear shift linkage with the engine running.



T0008278

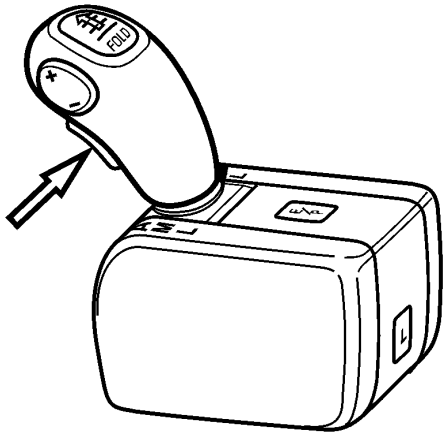
- Powertronic gearbox:
check that the engine can only be started when the gear selector is in neutral (N).

Check that the gear selector inhibitor must be pushed in to change gear:

1 From position N to R

2 From position N to a forward driving position

- I-shift gearbox:



T1008207

Check that the engine can only be started when the gear selector is in neutral (N) or is depressed.

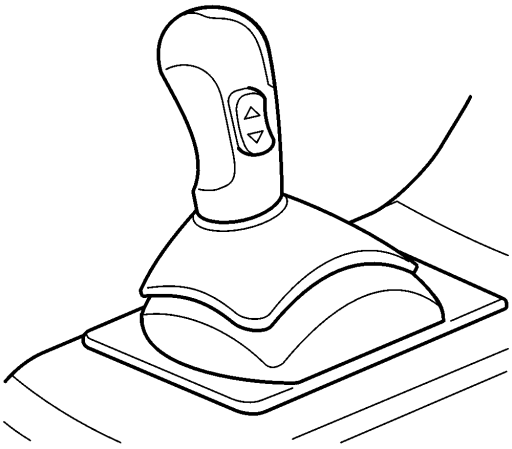
Check that the gear selector inhibitor must be pushed in to change gear:

1 From position N to R

2 From position N to a forward driving position

3 From position M to L

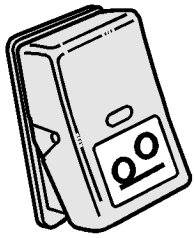
- Geartronic gearbox:



T1008220

Check that the engine can only be started when the gear selector is in neutral.

- Check that the gear selector does not have too much slack.



T0007833

28 Check bogie lift

1

- Operate the bogie lift by pressing in the top and bottom of the switch.

When operating the hydraulic bogie lift it should always be moved to one of its end positions.

29 Check brake pedal and foot brake valve

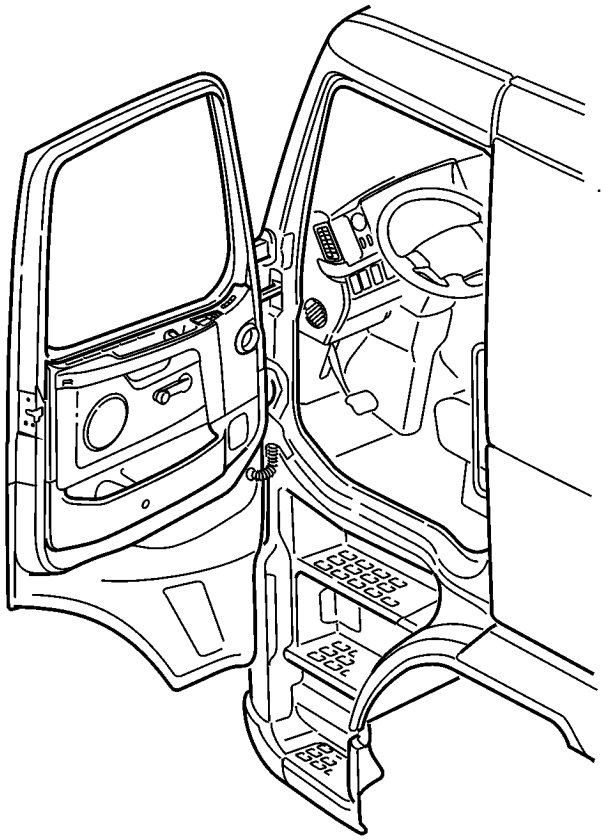
1

- Check that the foot brake pedal is easy to depress without it binding. The pedal should return quickly and fully.
- Check that the pedal clearance is approx. **5–10 mm**.
- Check for any wear in the pedal bearing.
- Check that the pedal rubber is intact and that the wear tread is still visible.
- Check that the brake valve is secure.

30 Check hinges, door stops, locks and sealing strips

1

- Check that the hinges do not bind.
- Check that the door stops are in good condition.
- Check the position of the door stop and adjust if necessary.
- Check that the locks work in two positions.
- Check that the sealing strips are in good condition and secured.



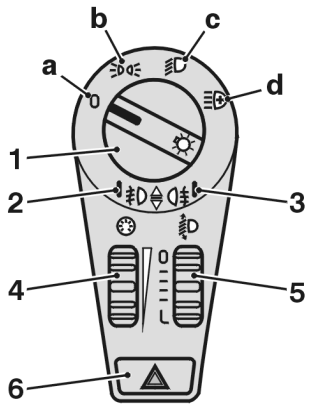
T1008213

External checks

31 Check lighting and reflectors

1

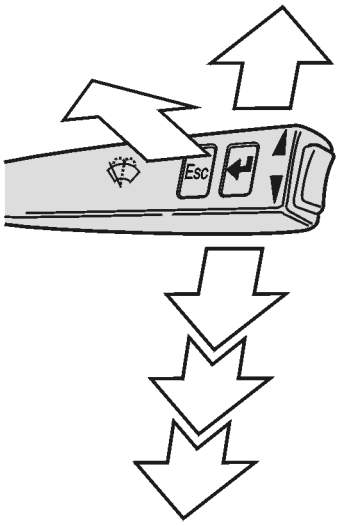
- Check **all** external lamps.
- Check that all lamp lenses are intact.
- Check that the reflectors are intact and no reflectors are missing.



T3014325

a	0 position
b	Parking lights
c	Headlights (main and dipped beams)
d	Main beam and auxiliary lights (spotlights)
1	Light switch
	Front fog lamp: Press the light switch
	Rear fog lamp: Pull out the light switch
2	Indicator for front fog lamp
3	Indicator for rear fog lamp
4	Dash illumination
5	Headlamp adjustment (extra equipment)
6	Warning flashers

32 Function check of wipers and washers

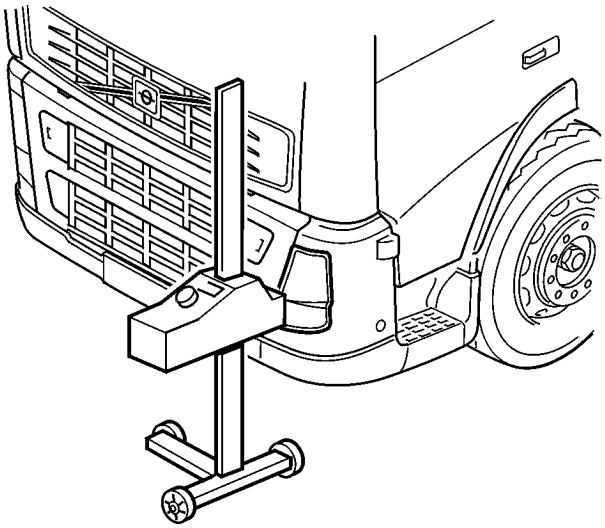


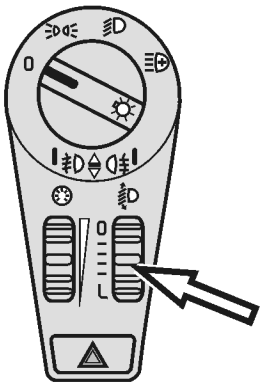
T3014359

1

- Check condition of all wiper blade arms, wiper blade rubbers, washer hoses and washer nozzles.

33 Check headlamps

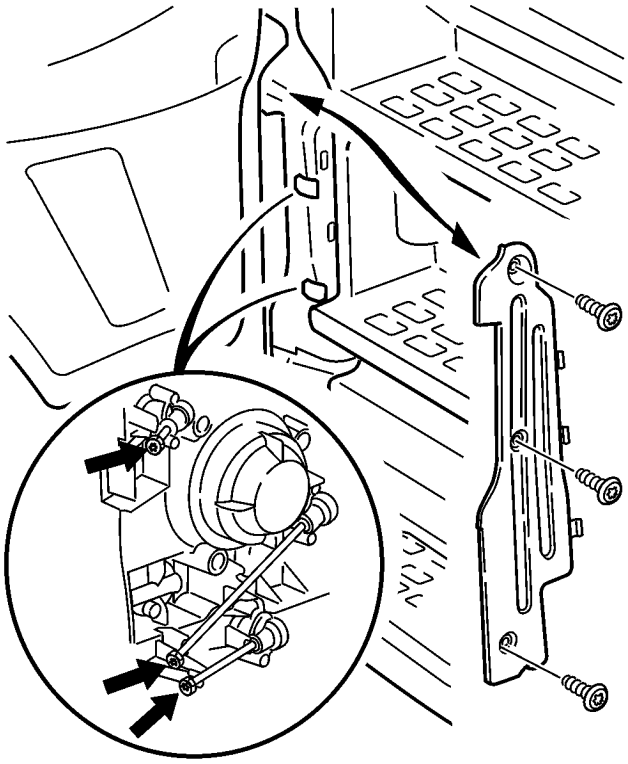




T1007903

1

- Ensure that the bogie is lowered.
- Vehicle with air springs: Check that there is air in the bellows and that the vehicle is in drive position.
- Vehicle with automatic headlamp adjustment: Check that the light switch control for the headlamp adjustment is set to position 0.
- Check the condition of the glass and reflector.
- Use a headlamp alignment instrument to check that the main and dipped beams are adjusted correctly.
- Check the adjustment of fog and/or spotlights if fitted.
- Check the luminance.
- Adjust the lights if necessary.

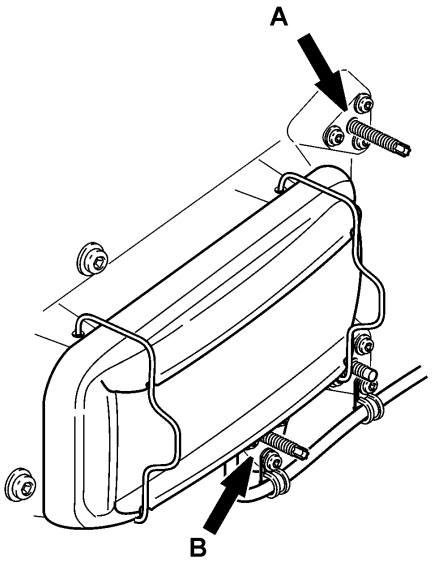


T3015650

Light adjustment FM, FH

1
In order to reach the adjustment screws, the panel in front of the foot step must first be unscrewed.

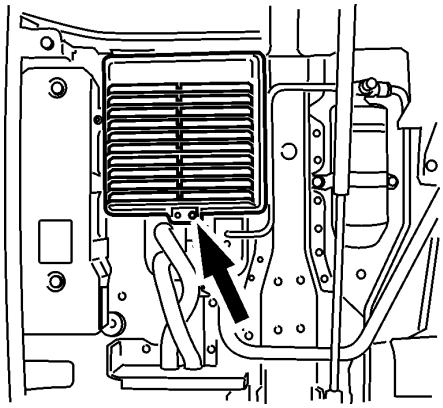
- The upper adjustment screw adjusts the horizontal position of the main beam and dipped beam.
- The middle adjusting screw adjusts the vertical position of the main beam and dipped beam.
- The lower adjusting screw adjusts the vertical position of the fog lights and spotlights.



C3001301

Light adjustment NH

1
- The upper adjustment screw (A) adjusts the horizontal position of the main beam and dipped beam.
- The bottom adjusting screw (B) adjusts the vertical position of the main beam and dipped beam.



T1007375

34 Replace A/C air filter and check roof mounted A/C

1
The air intake with filter is located behind the service panel.

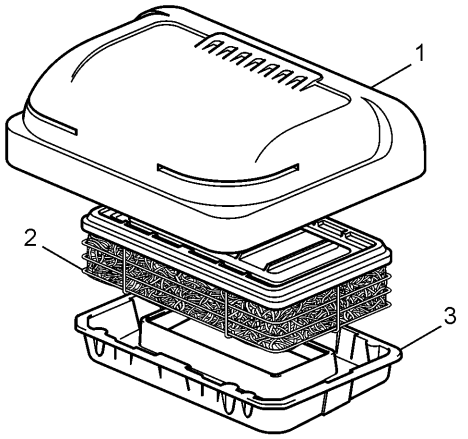
- Unscrew the filter retainer for the air conditioning air filter.
- Check O-ring sealing.
- Dismantle the filter retainer and scrap the old filter.
- Clean the filter retainer.
- Fit the new filter and assemble the filter retainer.
- Fit and screw tight the filter retainer.

Check roof-mounted A/C

1
- The air intake with filter is located on the roof of the cab.
- Remove the outer casing (1), radiator (2) and strainer (3).

Note: If, depending on change interval for the radiator, the radiator is to be replaced, see **Additional procedures, op no. 87425–2**.

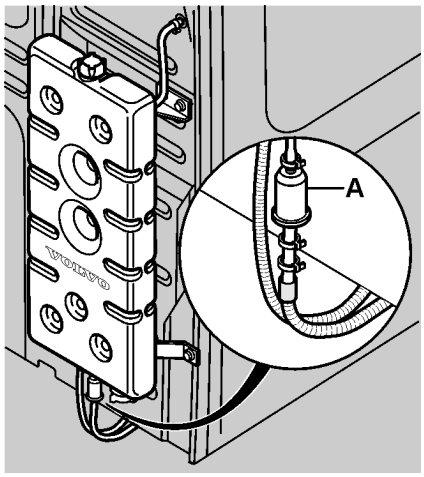
- Wash the radiator.



C0002020

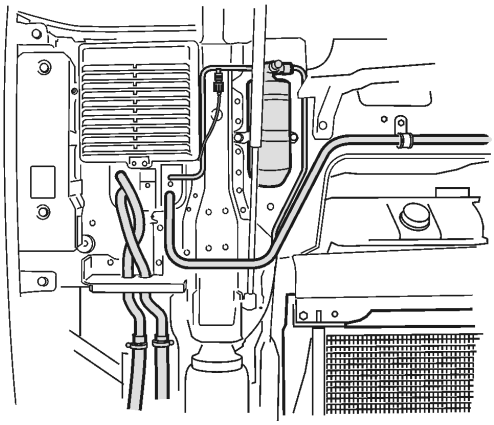
CAUTION
Do not use high-pressure jets

- Wash the strainer until all the remnants are gone.
- Remove the strainer (3), radiator (2) and outer casing (1).
- Remove the filter (A).
- Pour water onto the back of the filter until all the remnants are gone.
- Install the filter.
- Fill the container with distilled water.

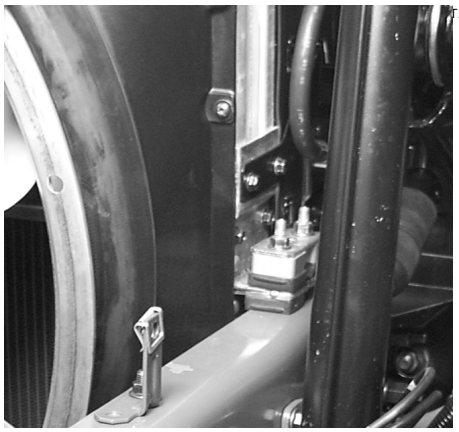


C0002001

35 Check reservoir for air drier, condenser, pipes and hoses



T1007376



T1006771

1

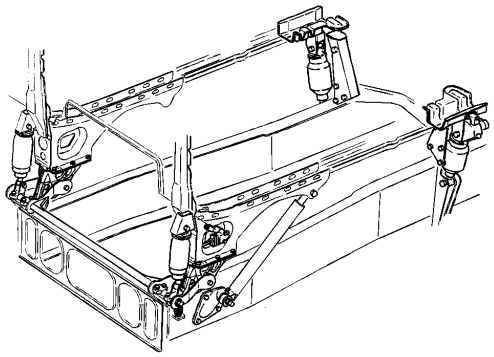
- Check the attachments for the condenser and refrigerant tank.
- Check that the condenser cooling ribs are not damaged or blocked by insects and dirt that can obstruct the air flow. Use a mild degreasing agent and water when cleaning.
- Check that hoses, pipes and wiring are not damaged and that pipe and hose clamps are intact.
- Check that the radiator and intercooler attachments, side plates and rubber pads are secure and in good condition.
- Visually check that bolt unions are tight.

36 Check air intake and air deflector

T1006759

1

- Check visually that the induction pipe is in good condition and that the rubber bellows seal against the pipe to the air cleaner housing.
- Check the attachment of brackets, rubber pads and screw unions for the air intake and wind deflector.
- Check that there are no cracks on the wind deflector or its attachments.



T1006760

T3008848

37 Check of cab anchoring, hydraulic system, locking devices, grille and cab tilting

1
The parking brake must be applied.

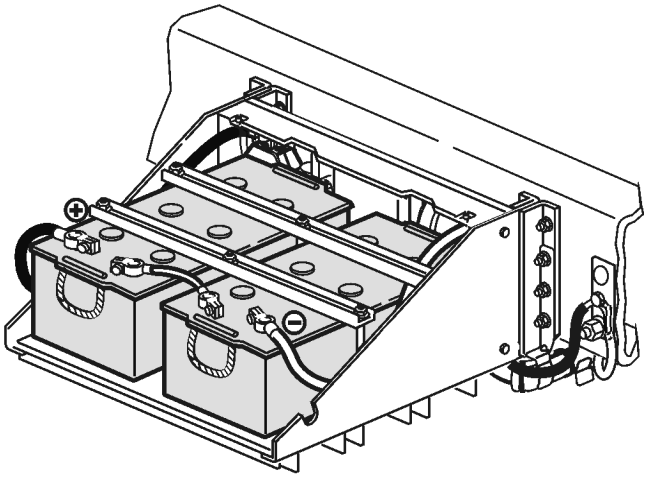
- Check the condition and attachment of the service panel and grilles.
- Check that the springs for the service panel are secure and hold up the panel properly.
- Check that the air bellows for the cab tilting are not leaking and are positioned correctly.
- Check the sealing and attachment of the level valves, levers and air pipes for the cab level regulation.
- Turn the starter key to drive position.
- Raise the cab so that the locking devices are exposed.
- Check that the symbol on the display or the control lamp for locking the cab comes on.
- Tilt up the cab and check that the cab tilting works correctly.
- Check that the hydraulic system pump, pipes, hoses and hydraulic cylinder are not leaking and are secured.
- Check that the shock absorbers are secure and not leaking.
- Check that the springs are in good condition and secure.
- Check the cab anchors to make sure they are good condition.
- Check that locking devices for the cab anchors, rubber stops, screws, pins, connectors and electrical connections for sensors to the cab lock are correct.
- Turn the starter key to 0 position.

38 Check batteries — dirt, leakage, attachment, fluid level, connections and battery box

1

WARNING

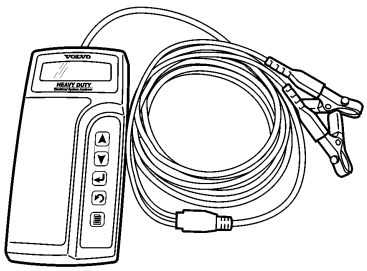
Batteries contain corrosive sulphuric acid.
Protective glasses should be worn when working with batteries.



T1007896

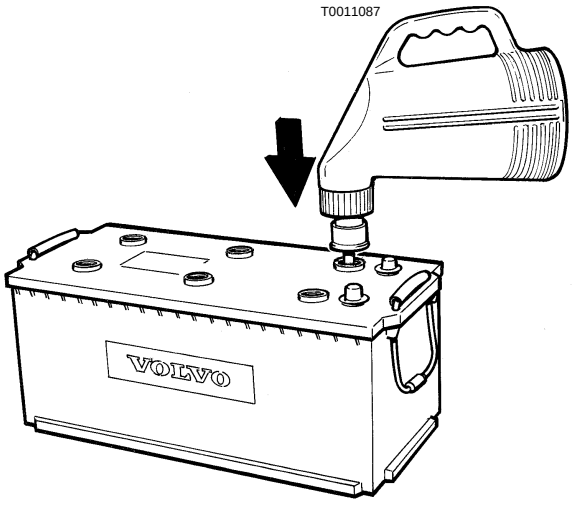
- Check that the batteries are not dirty.
- Check that the batteries do not leak.
- Check that the batteries are fastened down.

Note: Fasteners which are too tight can damage the batteries.



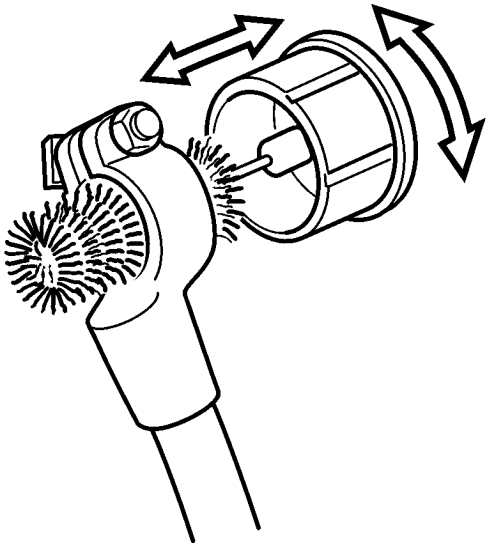
- Check the batteries with battery analyser 9812515 or 9812518.
- Ensure that the the level in the cells is approx **18-28 mm** above the cell plates **(South America)** and **5-10 mm** above the cell plates **(Europe)**.
- Top up with distilled water as required, max **28 mm** above the plates **(South America)** and **10 mm** above the plates **(Europe)**.

T0011087



T3008164

- Check that the battery poles are not corroded or damaged.



T1008197

- If necessary, clean the battery cable terminals and lubricate them.

- Check that the cable insulation is intact and that the cables are correctly located.
- Check all the earth cable connections to see that they are complete and undamaged.
- Check the earth cables from the battery's negative pole to the engine mounting, to see that it is complete and undamaged.
- Note comments from the customer concerning any possible starting difficulties. Starting difficulties can be caused by damaged cabling.
- Check the condition and attachment of the battery box.

Safety advice for battery charging

1 Always wear protective goggles.

2 Remove all cell plugs and put them back loosely in their holes.

3 Switch off the main switch if there is one.

4 Remove at least one pole shoe from the battery. (Some control units take their current supply directly from the battery.) Rapid charging can generate very high voltage, which can damage electronic equipment.

5 Charging should be conducted in a well ventilated area.

6 Smoking is **not** permitted. Avoid fire and sparks since oxyhydrogen gas develops during charging.

7 Turn the battery charger off before installing/removing the battery charging clamps.

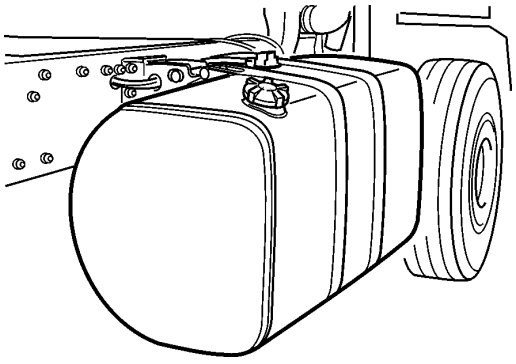
⚠ CAUTION

Be especially careful to follow the instructions to avoid personal injury and product or equipment damage.

For more information about batteries and battery charging, please refer to the Service information Group 31, “Batteries”.

39 Check fuel tank, hoses, air vent pipe and mountings

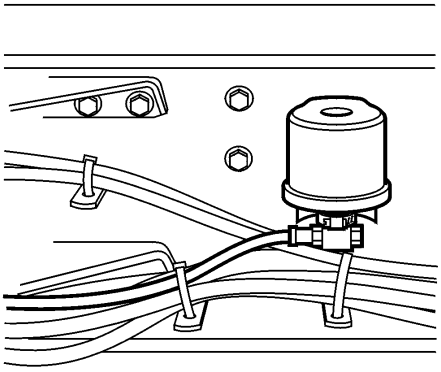
1



T2017419

- Check that the fuel tank venting hose **is not blocked**.
- Check that the pipes and hoses connected to the combined tank unit are clamped, do not leak and are not chafed.
- Check that no cracks or leakage occurs in the tank.
- Check that the tank suspension straps are not loose or cracked.
- Check that fuel tank mounting brackets are not loose or cracked.

40 Check fuel tank ventilation filter



T1006941

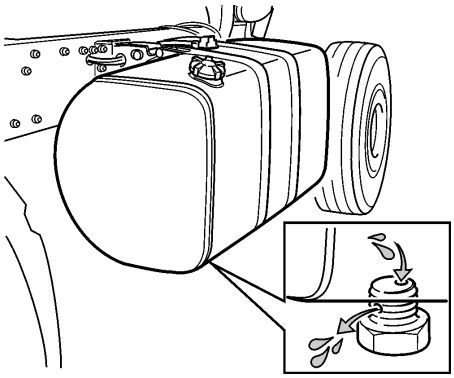
1
This filter is installed on certain markets.

Note: If the fuel tank ventilation filter has to be changed, depending on the filter service interval, please refer to **Additional measures, op no. 23414–3**.

- Check that the filter air inlet is not blocked by dust or dirt.
- Check that the filter and ventilation pipe are intact and securely fastened.

For information about filter service intervals, please refer to the service information “Lubrication service and oil changes” group 175.

41 Draining of fuel tank



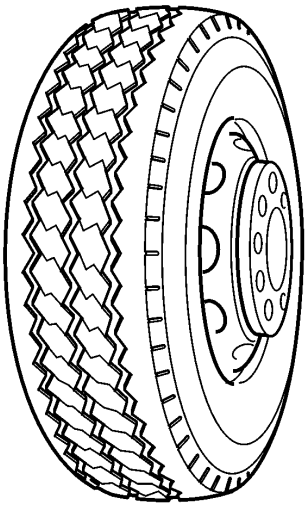
T2017418

1
- Place a container under the fuel tank bottom plug.
- Unscrew the plug a few turns until the bottom sediment with sludge and condensation begins to run out through the plug drain hole.

Note: Do not unscrew the plug completely or you will empty the fuel tank.

- Screw tight the bottom plug when clean fuel runs out.

42 Check tyre wear



T1008206

1
Check that the tyres have a normal wear pattern.

Note: Note any observations on the report!

Front tyres

- Check the front tyres for **depression wear**, which indicates a balance problem, extreme play in wheel bearings, spindle bearing or absence of inertia point in the centre of the steering gear.
- Check the front tyres with respect to wear directed sideways (raw edge) which indicates
- Check the front tyres for abnormal wear on one side of the tyre, which indicates a camber problem.

Rear tyres

- Check the rear tyre treads for abnormal heel-and-toe wear, which can be caused by adverse twin mounting.
- Check visible tendencies to wear marks between tyres in twin installation. If any wear marks are found, note them.
- Check tendencies to toe-in-wear, which indicates a wrongly set axle.

Spare tyre

- Check the condition of the spare tyre.

Engine bay

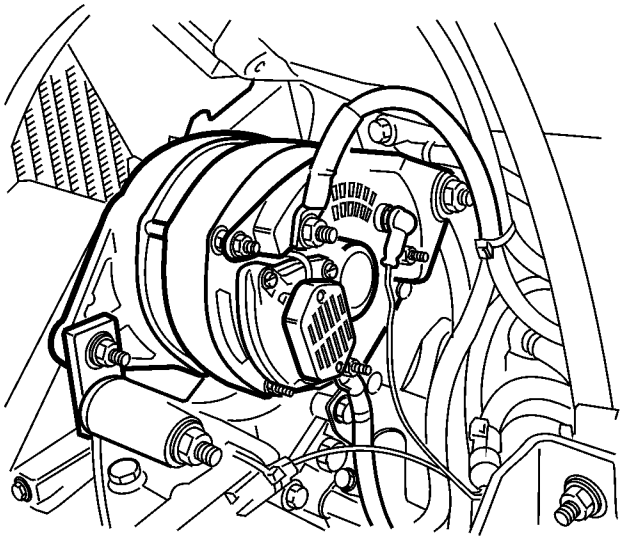
Remove the sound baffles from the frame members by the engine and any sound baffles under the engine to make the following operations easier.

43 Check alternator mounting

1

- Check that the alternator mounting is securely attached.
- Check that no screws or mountings are loose.

44 Check electrical connections and cables for alternator, starter motor, preheating unit and cab ground.



T1007555

1

Note: If, depending on charge regulator service interval, the regulator is to be changed, see **Additional measures, op no. 32204–3**.

- Disconnect the power in the vehicle using the main switch. If there is no main switch, undo a battery cable shoe.
- Check that the cable connections on the starter motor and alternator are secure.
- Check that the cable connections for the engine preheater are securely fastened.
- Check that all cable connections are complete and free from corrosion.
- Check that protective caps for electrical connections are in good condition and secure.
- Check that no cables are damaged.
- Check that the earth cable between the cab and the engine block is undamaged.
- Reconnect the power with the main switch or replace the battery cable shoe.

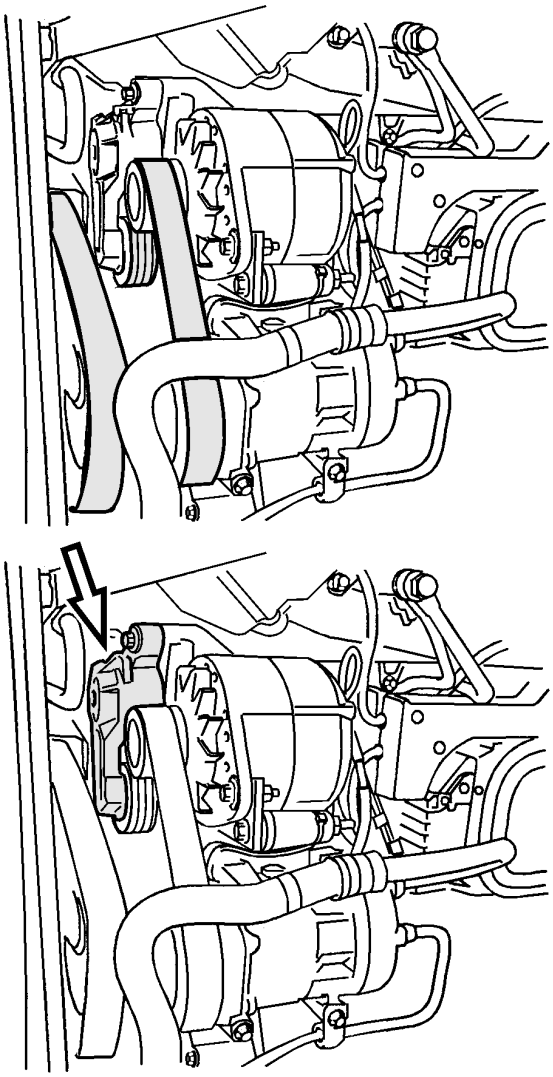
For information about the charge regulator service interval, please refer to the service information “Lubrication service and oil changes” group 175.

45 Check drive belts and belt tensioners

1

Note: If the drive belt has to be changed, depending on the multi-V belt service interval, please refer to **Additional measures, op no. 26307–3 and 32123–3**.

- Check that none of the drive belt ribbing has fallen off.
- Check that the drive belts do not have any cracks. The belt must be changed if there is any cracking.
- There must not be any dirt or grease on the drive belts or belt pulley contact surfaces.
- Check the automatic belt tensioner.



T1007557

1 Check belt tensioner operation.

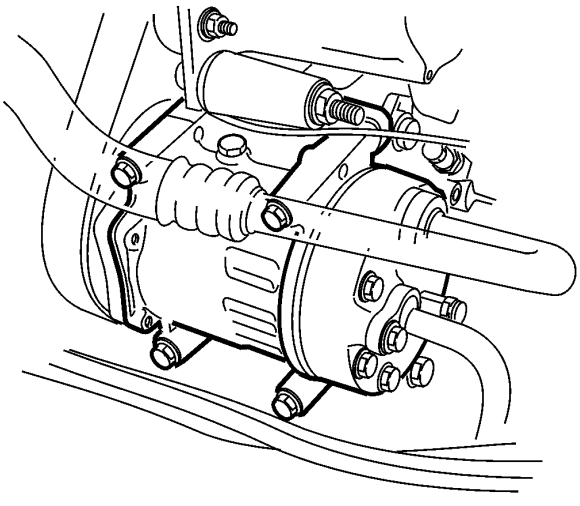
2 Release the tension on the belt tensioner with a draw handle and check the bearings in the belt tensioner rollers and in any support rollers.

For information about service intervals for multi-V belts, please refer to the service information “Lubrication service and oil changes” group 175.

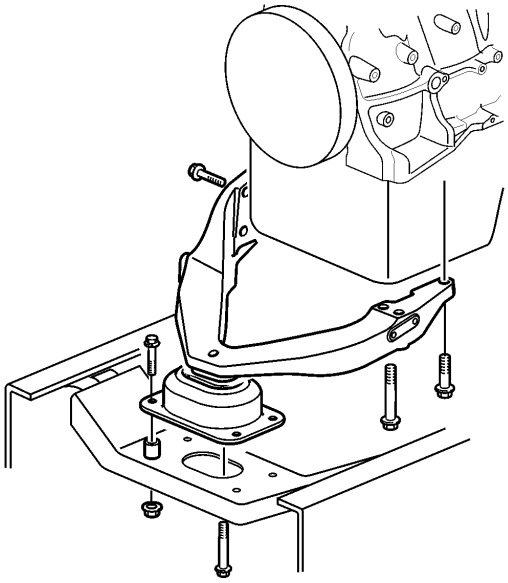
46 Check A/C - compressor for A/C unit

1

- Check the compressor mounting, that the compressor is secure and that the clamps for the hoses or pipes have not come loose.
- Check that the compressor is not leaking oil.



T1007730

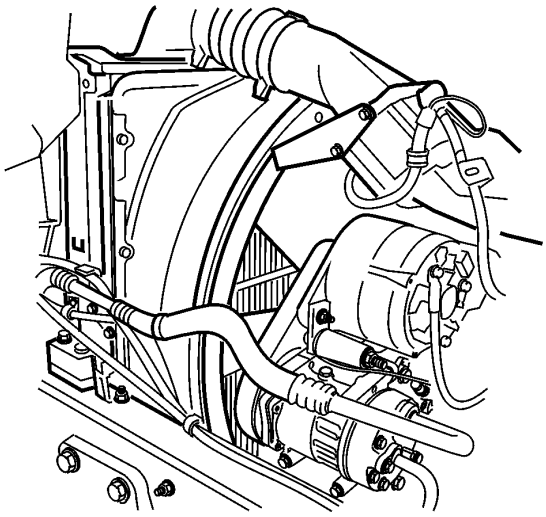


T1008212

47 Check engine mountings

1

- Check that front and rear rubber pads are intact.
- Check that the brackets are in good condition and tightened.

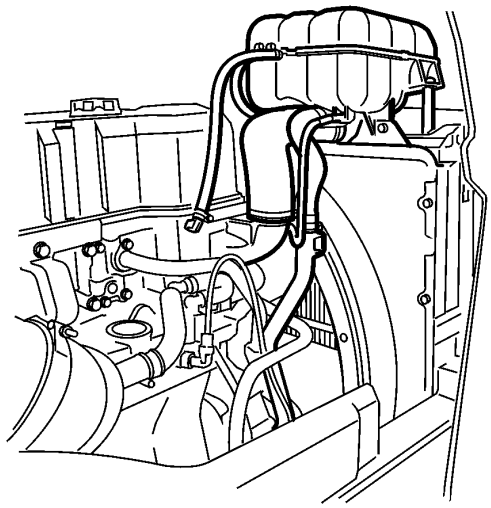


T1007725

48 Check radiator fan, bearing tolerance, screw unions, fan shroud and fan ring with rubber seal

1

- Check that the fan blades are undamaged and that there are no cracks.
- Check that the fan coupling does not have an abnormal amount of play (too much bearing clearance) or leak oil.
- Check the fan bolt unions with a spanner.
- Check that the fan rotates.
- Check that the fan cowling does not have any cracks.
- Check the screws on the fan cowling and fan ring
- Check that the rubber seal on the fan ring is in contact with the fan cowling.

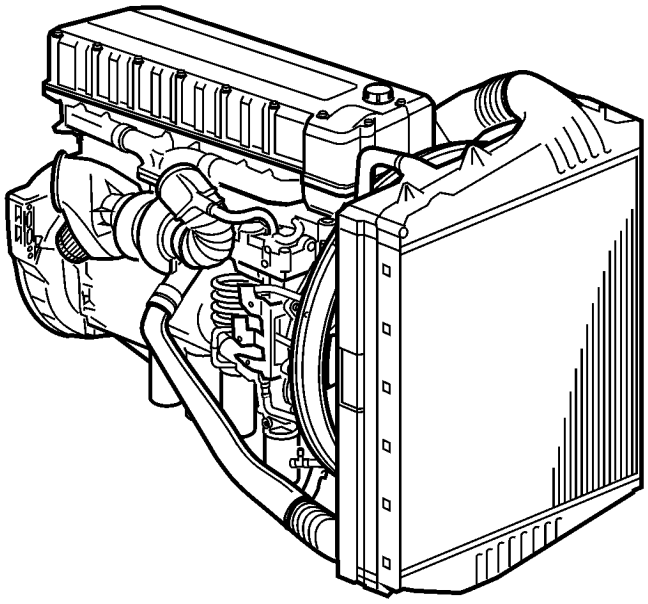


T1007726

49 Check radiator, hoses, pipes and air through-flow

1

- If there is a complaint about high coolant temperature, or if the radiator is dirty, see service information group 26.
- Check that the radiator is not damaged, does not leak and is securely fastened.
- Check that the coolant hoses or pipes are not chafed.
- Check ageing (hardness), cracks and delaminating (blisters) on the coolant hoses.
- Check that the hoses or pipes do not leak.
- Check from the outside that the core is not blocked by insects or other objects that can obstruct the air flow.
- If the vehicle is fitted with an insect net, check that the net is not blocked or damaged.

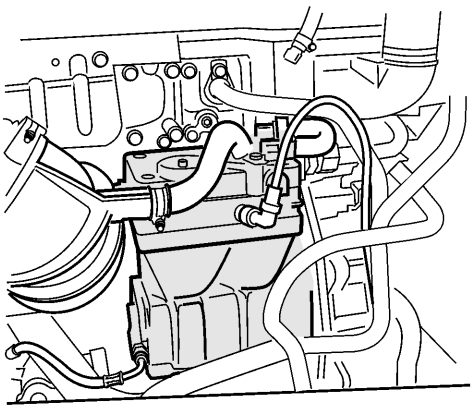


T1007371

50 Check intercooler, hoses, pipes and air through-flow

1

- If a complaint has been made about high coolant temperature or if the intercooler is dirty, see service information group 26.
- Check that the intercooler is in good condition.
- Check that the hoses and pipes between the engine and intercooler are undamaged and are not chafed.
- Check clamps and screws for the hoses and pipes between the engine and intercooler.
- Check from the outside that the core is not blocked by insects or other objects that can obstruct the air flow.

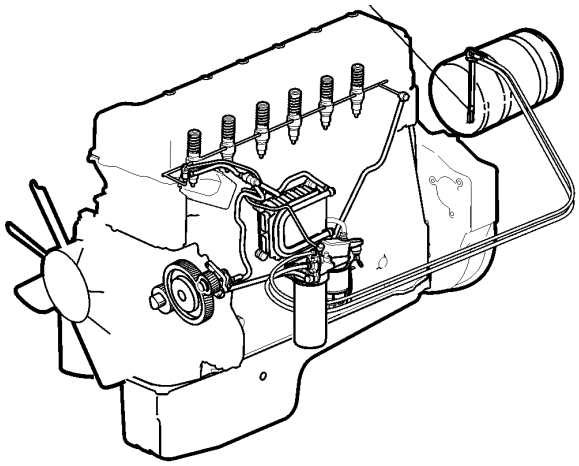


T1007729

51 Check engine, engine powered power take-off and compressor for leakage

1

- Check that the engine does not leak oil or coolant.
- Check that the pipe unions, flanges and hose unions seal correctly.
- Check that the hoses or pipes are not chafed or cracked.
- Check that the engine-driven power take-off and pipes do not leak oil.
- Check that the compressor does not leak oil or coolant.

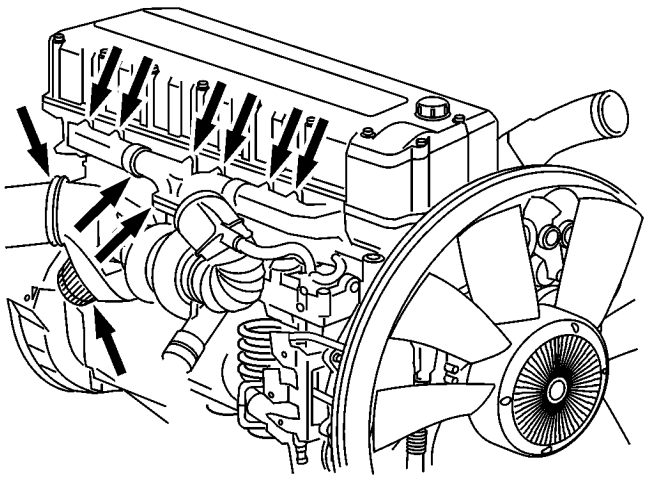


T1007369

52 Check fuel piping and lines

1

- Check that the hose and pipe nipples on the fuel lines do not leak
- Check that the fuel pipes do not leak and are not chafed.



T1007370

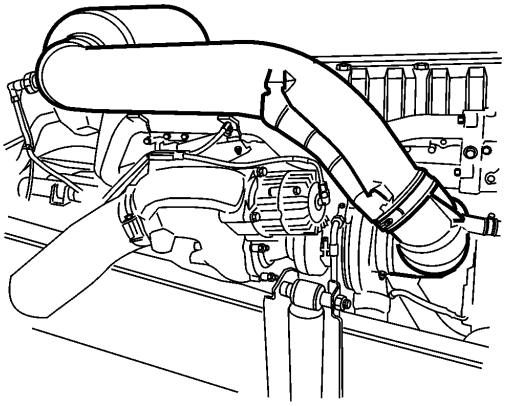
53 Check for exhaust leakage

1

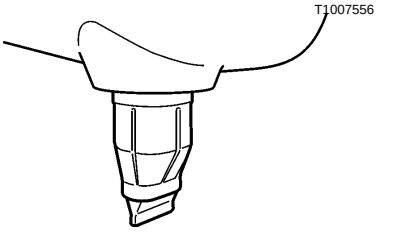
Exhaust leakage is visible as soot.

- Check if exhaust leakage is found around the exhaust ports on the cylinder heads, on the manifold joints and flanges.
- Check if exhaust leakage occurs by the exhaust pressure governor, exhaust brake or by the joint clamps for the front exhaust pipe.

54 Check air pipe between air intake and turbo



T1007556

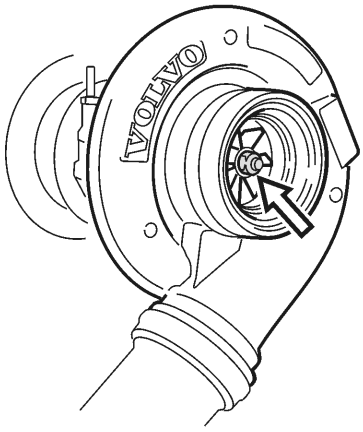


T1008216

1

- Check that hoses and pipes between the air intake on the air cleaner housing and turbo are not cracked, chafed or have loose clamps.
- Check that the air filter housing is secure and not cracked.
- Check that the rubber valves are in good condition and not leaking.
- Pinch the rubber valves so that dust and dirt falls out.
- Check that all clamps are tightened.
- Check that hoses, pipes and clamps for the air compressor intake are in good condition and that no clamps are loose.

55 Check turbocharger and EP regulator



T1007385

1

- Remove the intake hose from the compressor housing.
- Check that the compressor wheel is not damaged and that it rotates easily.
- Check visually that the compressor does not have any visible damages.
- Check that the compressor section is clean, i.e. that no oil leakage occurs.
- Check that the EP regulator hose and pipe connections are tight and do not chafe.
- Check AT regulator regarding tightness and leakage.

56 Check engine sound baffles

1

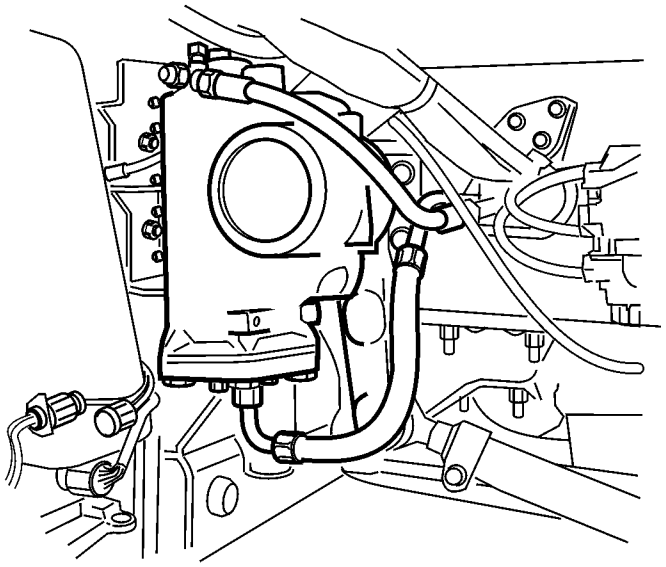
- Check that the sound baffles are in good condition and not damaged.
- Check that attachments for the sound baffles are in good condition and hold the sound baffles in place.
- Fit where appropriate loose sound baffles on the frame members at the engine and where appropriate the sound baffle under the engine.

Front suspension, steering gear

57 Check sealing on servo pump, oil connections, oil hoses and steering gear

1

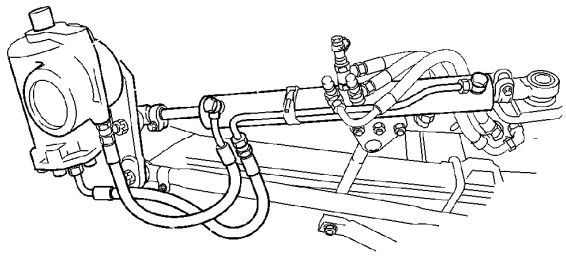
The engine must be running (approx. 1000 rpm).



T1007727

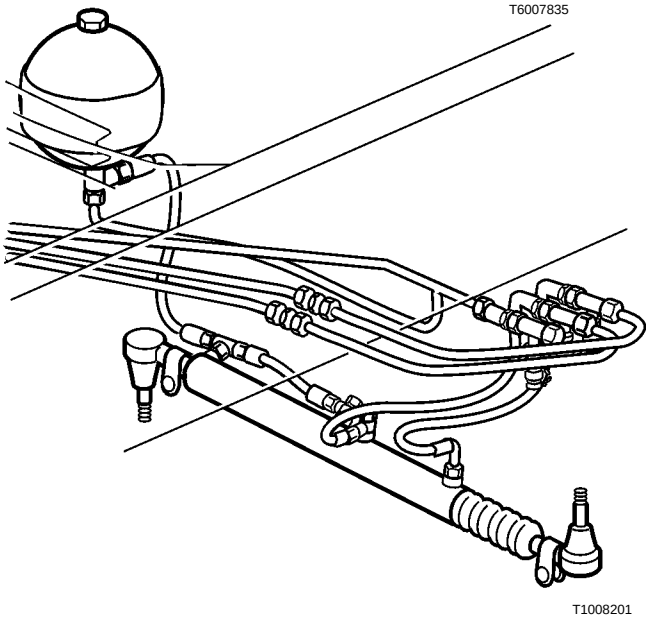
- Check the pressure side of the servo system with regard to oil leakage from the steering servo pump (two for dual servo steering systems, one steering servo pump on the engine and one on the gearbox), oil reservoir, hoses and pipes, steering gear and hydraulic cylinder.
- Stop the engine.
- Check for any air leaks on the suction side. Check for air bubbles in the power steering fluid.
- Check that the hoses and pipes for power steering are undamaged and are not chafed.
- Check that the clamps for pipes and hoses have not come loose.

Control system for hydraulically steered pusher axle or trailing wheel axle:



- Check that there is no oil leaking from the master cylinder, hoses, pipes, unions, nipples, flow indicator and solenoid valve in the control system.

T6007835



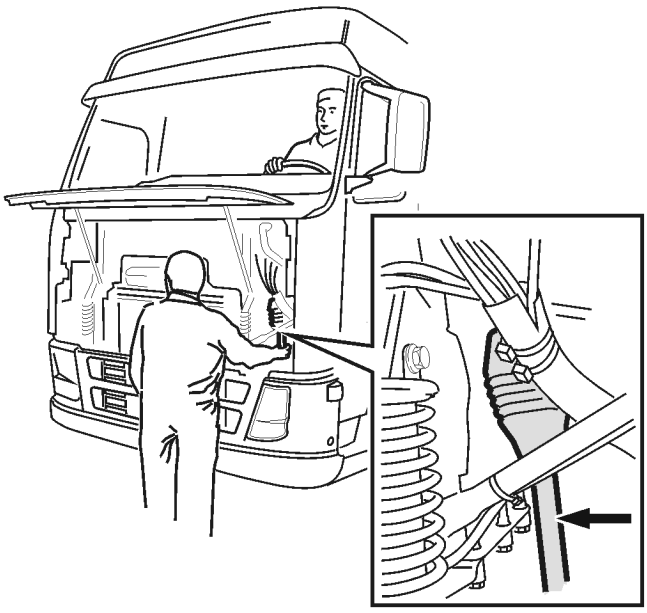
T1008201

- Check that there is no oil leaking from the pressure accumulator and the centring cylinder or at hoses, pipes, unions and nipples.
- Check that pipes and hoses for the pusher axle or trailing wheel axle are intact and not chafed.
- Check that the clamps for pipes and hoses have not come loose.

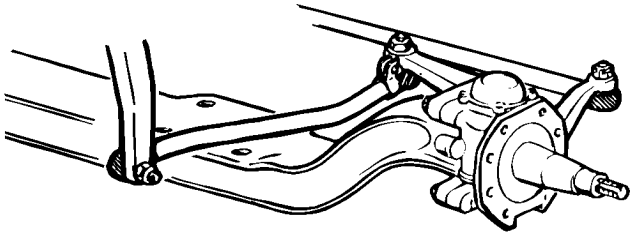
When any work is done on the steering system, use service information group 6 as an aid.

⚠ WARNING

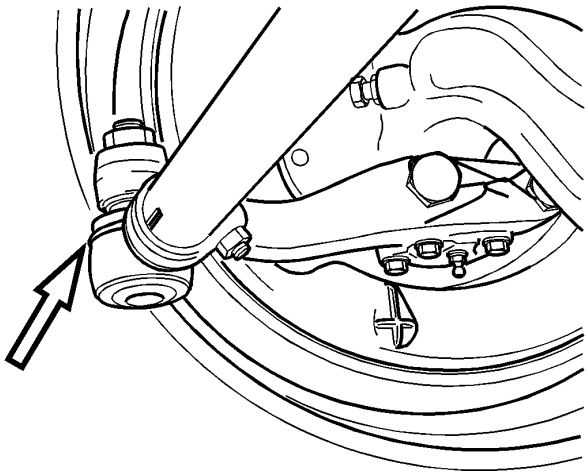
The pusher axle and trailing wheel axle control system is constantly under pressure (15 bar), even when the engine is stationary. For this reason, be particularly careful in observing the instructions to avoid personal injury and damage to product or equipment. **Negligence can lead to minor or moderate personal injury or product damage.**



T6008659



T1006492



T1006482

58 Check steering link system

1

- A good way of checking condition and play is to have the vehicle standing on the floor with two mechanics working together.

Two mechanics work together.

- The cab must be in lowered position.
- Put the wheels in the straight ahead position.
- Mechanic 1 sits in the cab and turns the steering wheel back and forth while mechanic 2 grips the lower part of the steering column. This check must be done at both ends of the lengthways adjustment range of the steering wheel.
- Check the steering wheel raising and lowering function.

Note! There must be no play evident when checking. No abnormal noise/feel may occur when the steering wheel is raised or lowered within its range of adjustment. If any abnormal noise/feel occurs, please refer to the service information, group 6.

This is done by one of the mechanics:

- Pull the steering wheel to and fro and check steering wheel clearance, fixing and condition and the fixing of the steering shaft tube (with or without power assistance).

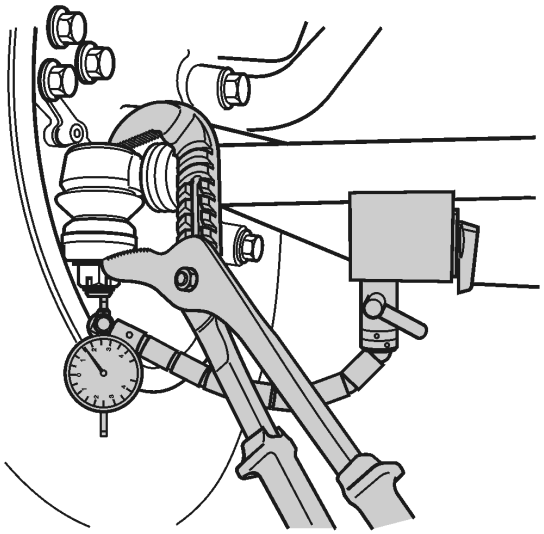
The second mechanic does the following:

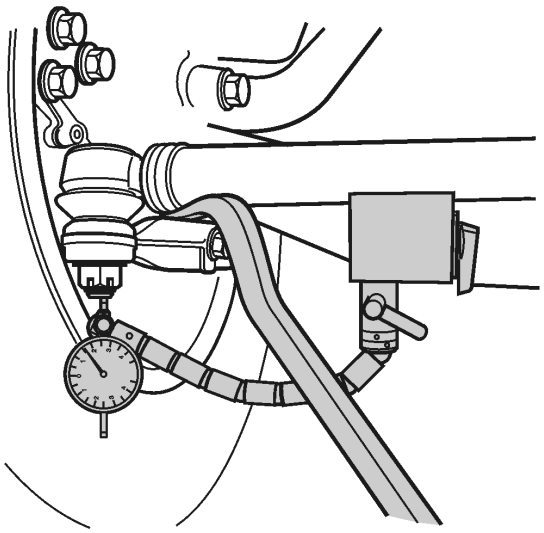
- Check that the ball joints on the track rods, link rods, steering rods and extra hydraulic cylinder are not loose. Use dial indicator **9808092** and magnetic holder **9812528**. Maximum permitted axial play is 2mm.
- Check that the rubber boots on ball joints on the track rods, link rods, steering rods, extra hydraulic cylinder and the master and centring cylinder for the hydraulically steered pusher axle or trailing wheel axle are intact and seal correctly.

If any of the rubber boots are cracked or damaged, the ball joint must be changed.

Note: A cracked or damaged rubber boot means that the ball joint wears out quickly.

- Put the wheels in the straight ahead position. A worn ball joint has its greatest play in this position.
- Press the ball joint together with to its inner end position using Polygrip pliers. Set the dial indicator to zero.
- Separate the ball joint as much as possible using lever **1158289**.





T6009384

Maximum permitted axial play is 2 mm.

If the play exceeds 2 mm, the ball joint must be changed.

If you are not sure about the play in ball joints, use service information group 6 as an aid.

- Check that there is no play in the intermediate steering arm and the attachments for the hydraulic cylinder for double front axles.
- Check the anchorage of the track rod, steering rod and link rod, and ensure that the clamps are not damaged and are tightened.
- Check that the Pitman arm on the steering gear is firmly fixed, that the nut is tightened and that the nut is correctly locked.
- Check the steering gear attachment in the bracket and frame member, i.e. that there are no cracks or loose bolted joints.
- Check the attachments of the intermediate steering arm and the hydraulic cylinders, to ensure there are no cracks, play or loose bolted joints.
- Check the steering column joints and steering shaft. The joints must not have any play and the locking bolts must be tightened.
- In order to avoid corrosion on the input shaft to the steering gear and steering shaft joint, the following must be done:

  1 Clean the lower part of the steering wheel shaft universal joint.

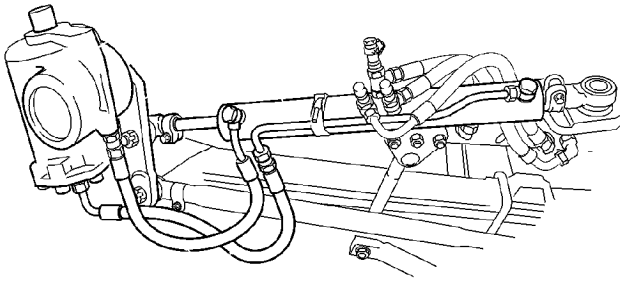
  2 Turn the steering wheel so that the slit in the steering shaft universal joint points backwards.

  3 Spray the slit and around the bottom of the steering shaft joint with anti-corrosion agent, part no. **1381063** or equivalent.

T1006795

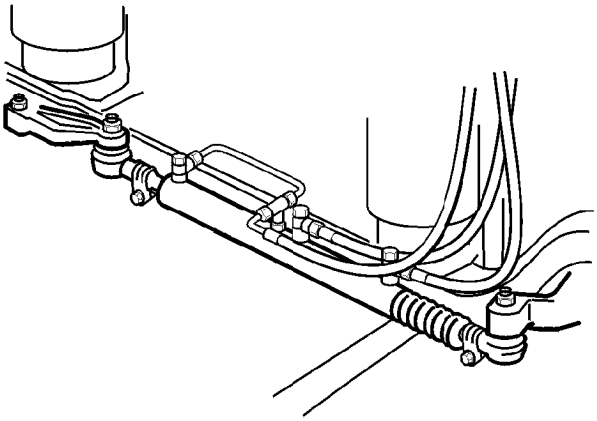
The steering shaft joint must **not** be loosened from the steering gear during rust prevention treatment

- Check the fixing of the master cylinder and the centring cylinder on vehicles with hydraulically steered pusher axle or trailing wheel axle: to ensure that there are no cracks or loose fasteners and that the clamps are not damaged and are tight.

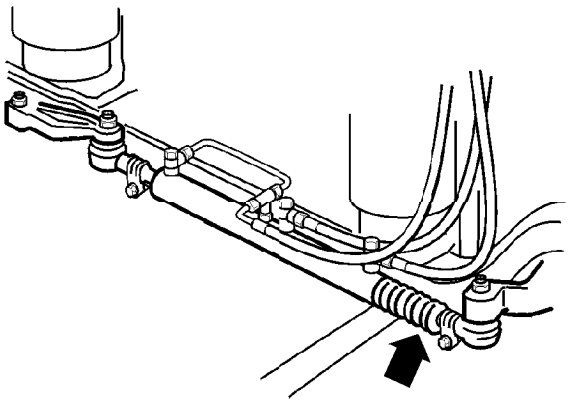


T6007835

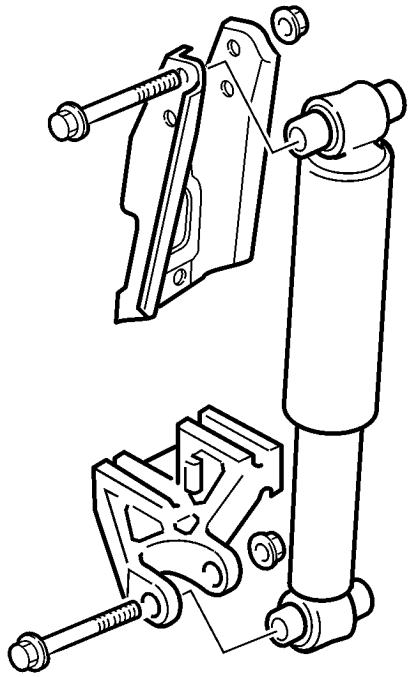
- Check that the rubber boot on the centring cylinder is not damaged or cracked, and that the boot is securely fixed.



T6007812



T6007836

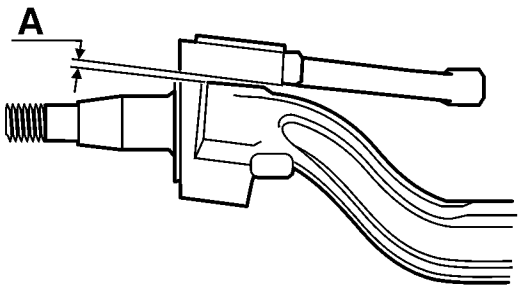


T1008218

59 Check front shock absorbers

1

- Check the rubber bushings.
- Check that the shock absorber attachments are secure.
- Check that the shock absorber brackets are in good condition and that they are secure.
- Check if there is any oil leakage from the shock absorbers and make a note if there is.



T1008221

60 Check king pin bearings

1

Check **axial clearance** between the axle shaft and axle member (A) on both sides.

- The vehicle should be standing on the floor during measurement of axial clearance so that the kingpin bearing is under load.
- Measure the clearance between the axle shaft and axle member with a feeler gauge.

for information on permitted value (A) for axial clearance, depending on type of axle, see Service Information group 6.

Check **radial clearance** in the king pin bushing on both sides.

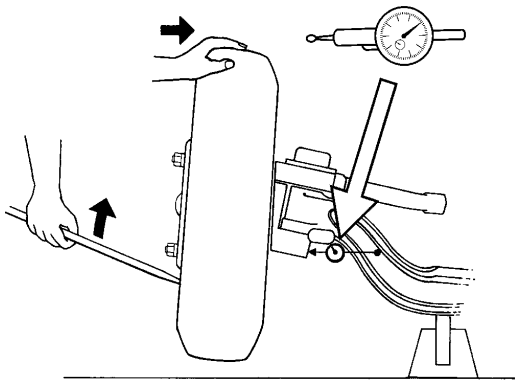
1 Block up the vehicle under the axle.

2 Apply the foot brake with a pedal jack or an assistant, so that the play in the wheel bearings does not influence the measurement.

3 Check the clearance in the kingpin bushing by using a bar as a lever to lift in the wheel hole.

For information on the permitted radial clearance in the kingpin bushing, depending on the type of axle, see service information group 6.

If in doubt of the amount of radial clearance in the kingpin bushing, use one of the following methods to determine the present amount of radial clearance.

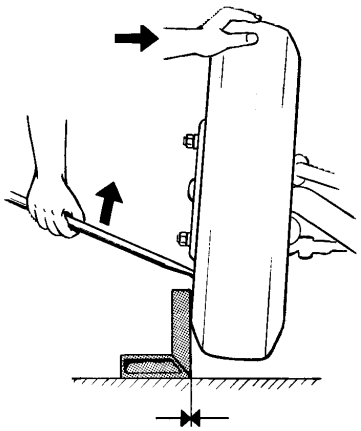


W6000845

Measurement of radial clearance of kingpin bushings with a dial gauge

- Place a dial gauge with magnetic stand on the front axle against the lower part of the axle shaft by the kingpin bushing.
- Use a bar as a lever to lift and check the bushing radial clearance on the dial gauge.

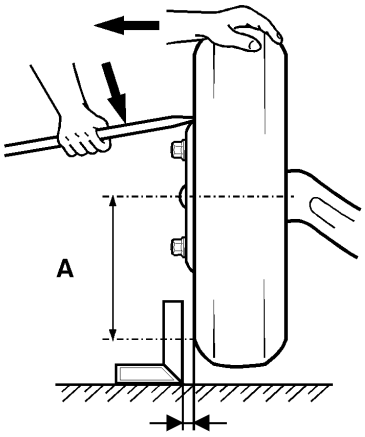
For information on the permitted radial clearance in the kingpin bushing, depending on the type of axle, see service information group 6.



T6007291

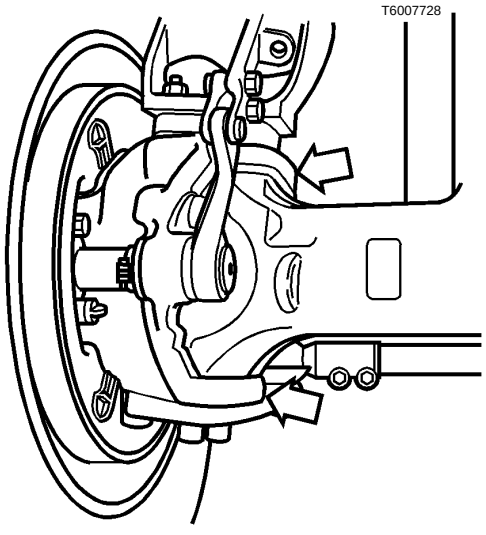
Measurement of kingpin bushing radial clearance to the tyre side

- Lift up using a bar as a lever in the wheel hole.
- Place a support, e.g. set square, against the side of the tyre.



- Prise the lever downwards. At the same time, measure accurately the distance between the support and the tyre. The measured radial clearance at the measuring point will be much greater than the maximum permitted radial clearance in the bushing, which is dependent on the distance between the bushing and side of the tyre.
- Check the radial clearance on the kingpin bushings by using the measured distance and respective table, depending on the type of axle, in service information group 6.

If there is play, carry out the tightening procedure as is service information 6.



T6007728

Vehicle with driven front axle

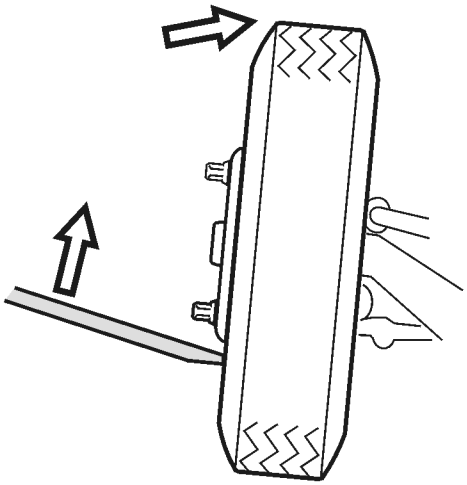
The steering knuckle attachments for driven front axle have tapered roller bearings, which are under tension and should not have any play.

T0008542

61 Check front wheel bearings

1

Note: On a vehicle with a driven front axle the front wheel bearings **must not** be checked with a wheel spinner in view of the risk of damaging the component.



T1008223

The front of the vehicle should be supported on pallets and the parking brake must not be applied.

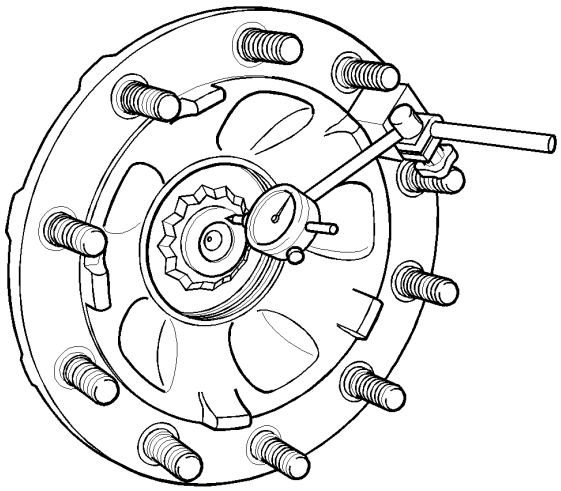
- Check the front wheel bearings with a wheel spinner and listen to the bearings during the rotation.

Note: Note in the report any noise from the front wheel bearings that does not sound right.

Abnormal noise in the bearings is a sign of bearing wear. Hubs with bearings should therefore be replaced to avoid damage to the bearings.

- Check front wheel bearing play by lifting with a lever in the wheel hole. The bearing should normally be preloaded so there should not be any noticeable play in the bearings. Do not confuse play in the wheel bearings with play in the kingpin bearings.

Nevertheless, in certain cases a bearing play of **up to 0.1 mm** can be allowed.
If there is play in the bearings, **bearing clearance should be measured with a dial gauge**.



T1008505

Note: Note the bearing clearance!

- If the bearing play is **0.2 mm or greater**, the hub and bearing must be changed immediately to avoid future bearing breakdown.

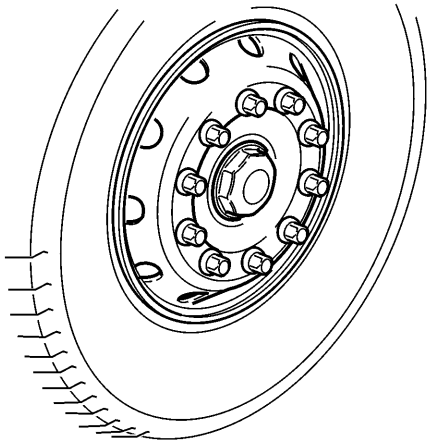
Note: The bearing clearance cannot be adjusted.

- The wheel bearings for **the driven front axle** are under tension and should not have any play.

For work procedures on hubs, use service information group 7, as a guide.

62 Check front wheels

1
Disc wheel



T1008222

Check the wheels for cracks and rust that can indicate loose nuts or broken wheel bolts.

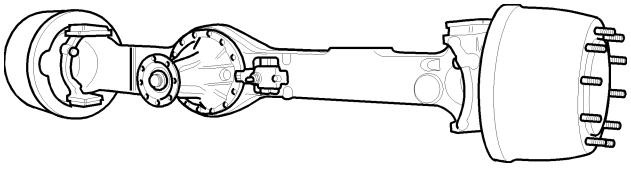
Spoke wheel

- Check that all wheel nuts and retainers are in position.
- Check that the fitting is correct and that the wheel is centred.

Check underneath the vehicle

Remove gearbox sound baffles to simplify the work round the gearbox.

63 Check sealing, bearing clearance and ventilation on driven front axle

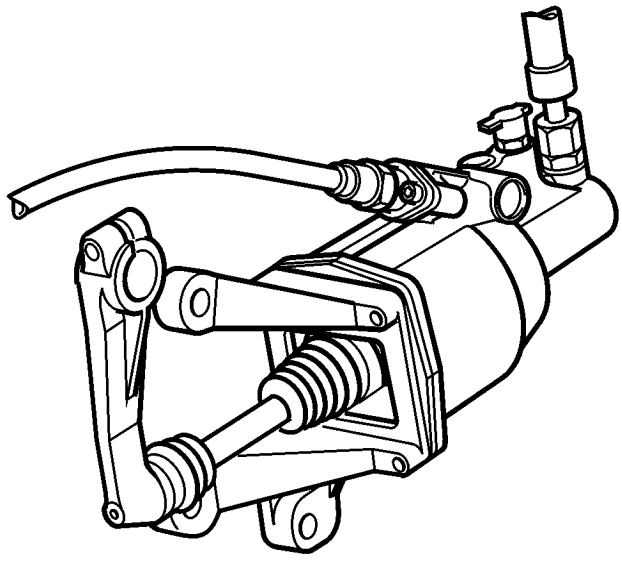


T4011554

1

- Check that the front axle and hub reduction gear do not leak oil.
- Check that there is no play in the pinion bearing by lifting the front axle gear follower up and down. **Any movement indicates a loose nut or a loose bearing.**
- Check that the driven front axle breather is not blocked.
- Check that the breather hose is securely fixed to the nipple.
- If the breather hose is drawn up into the chassis, check that the hose is intact, not pinched and that the mounting clamps are intact.

64 Check slack in mechanical linkage for clutch



T4017821

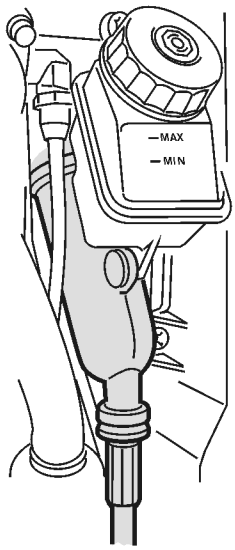
1

- Remove any sound baffles under the gearbox.
- Check that there is no slack in the release lever.
- Check that the gaiters for the clutch servo and on the release lever ball-joint are intact.

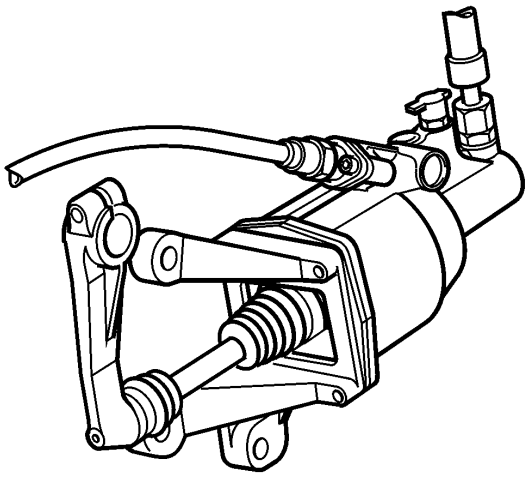
65 Check clutch hydraulic and pneumatic control system

1

- Check that the hydraulic cylinder does not leak and that the piston returns properly.



T1008225



T4017821

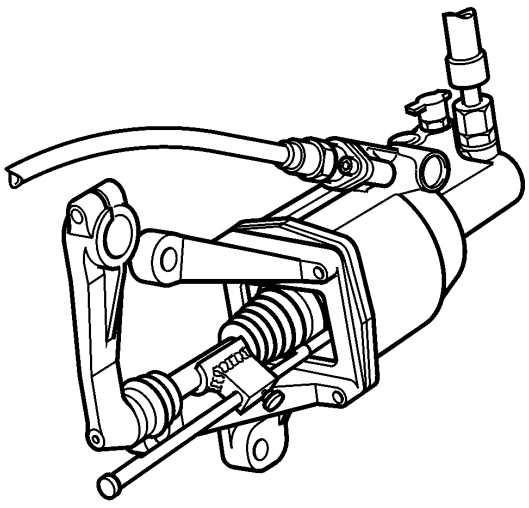
- Check that the clutch servo, connections and hoses are not leaking and that the hoses are in their correct positions.

66 Check clutch wear

1

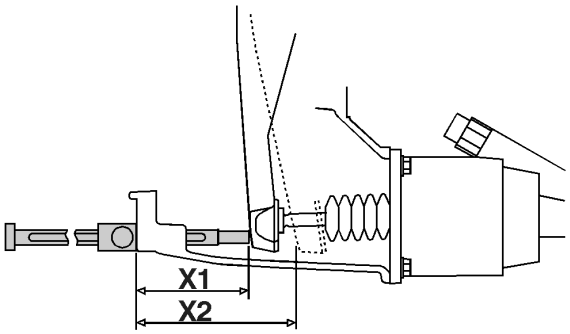
Use Service Information group 03 and 4 as aids when checking clutch wear.

Measurement involves following the movement of the clutch servo



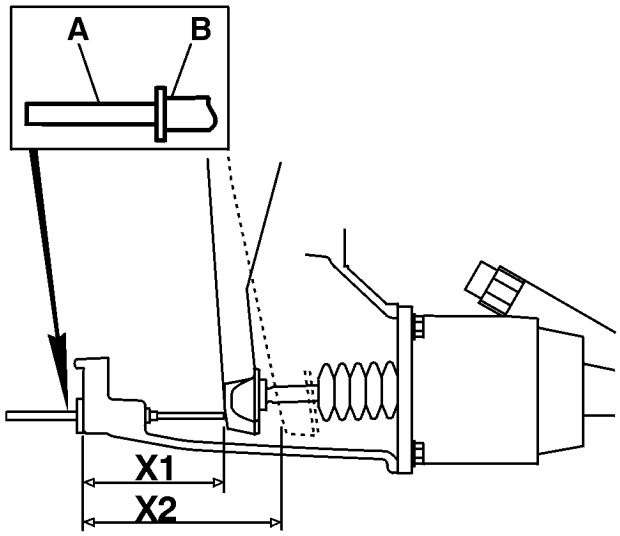
T4017820

- Use measuring tool 9998579 for measuring.
- When measuring on vehicles with air suspension use measuring tool 9998698.

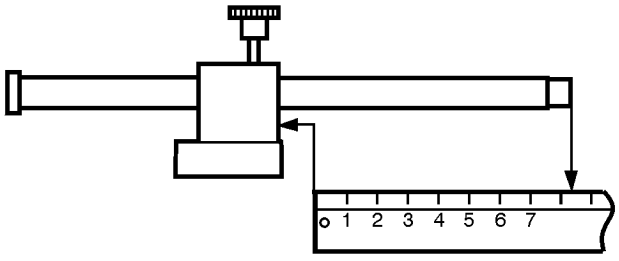


T4012961

- Use a ruler or similar to measure wear.

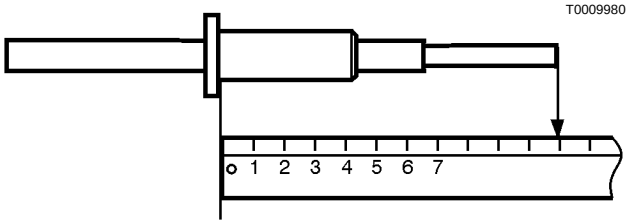


T4017829



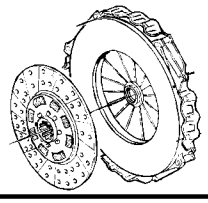
9998579

T0009980

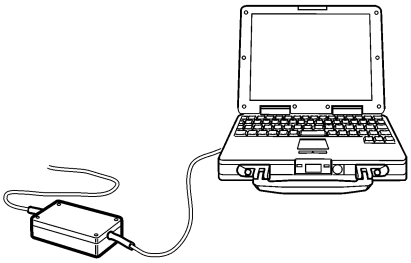


9998698

T1008224

SB411-18 SB411-20 	X1	X2	Y	D
	.....mm	.....mm	.....mm	.....
	.....mm1	.....mm	.....mm	.....
	.....mm2	.....mm	.....mm	.....
	.....mm3	.....mm	.....mm	.....
			.....mm	

T4012798



T0009521

- 1 Write down the recorded value on the label at X2.
2 Check the remaining wear surface on the clutch.

To check the remaining amount of wear on the clutch, and for information on the values for maximum amount of wear on the clutch, see Service Information group 41.

- Clutch wear can also be checked with PC tool via the data link connector on vehicles with Geartronic and I-shift gear systems.Use Service Information group 03 and 4 as aids

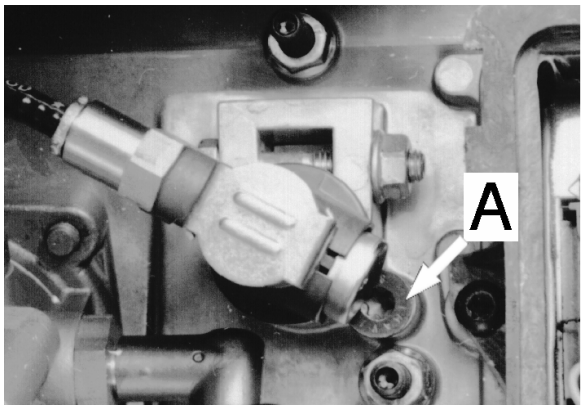
67 Check splitter control system

1

- Check that there are no air leaks from the splitter gear inhibitor valve or compressed air lines.
- Check that the inhibitor valve is correctly adjusted.

Note: Any adjustment of the inhibitor valve should not be carried out until the clutch setting has been checked.

To check and adjust the inhibitor valve, use service information group 4 as a guide.

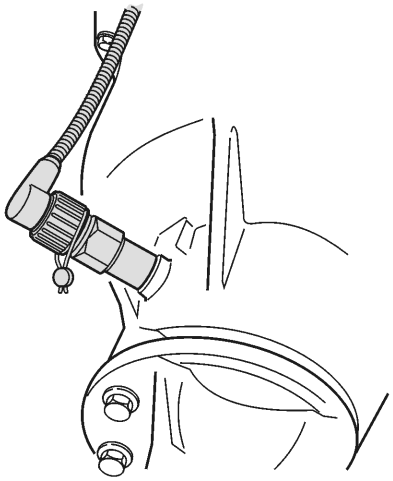


T1008219

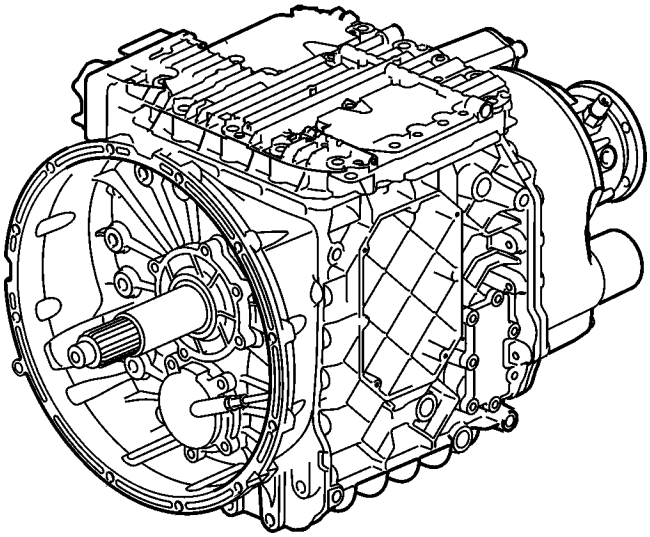
68 Check sealing on the speedometer

1

- Check that the seal on the speedometer sensor on the gearbox is intact.



T1008226

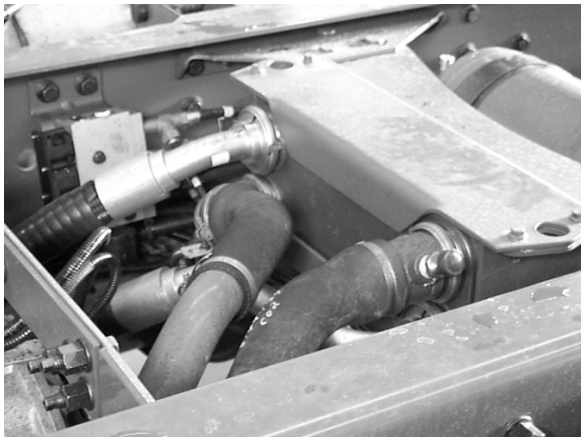


T1008199

69 Check sealing on the gearbox, transfer gearbox and power take-off, and check cables

1

- Check that the gearbox, manual or automatic, does not leak oil or coolant.
- Check that pipes and hoses for oil cooler are secure and not leaking.
- Check that the power take-off or transfer gearbox does not leak oil.
- If leakage, check the oil level.
- Check that there is no air leakage from components or compressed air pipes.
- Check that electrical connections, electric cables and compressed air connections on the gearbox are secure and not chafing.
- Check that the wire controls between the gear lever and the gearbox are not damaged and are secure



T1006782

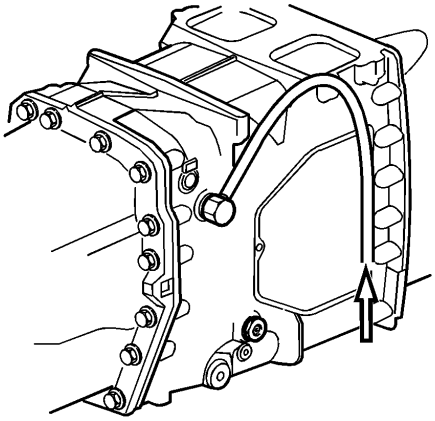
70 Check sealing of oil cooler for automatic transmission

1

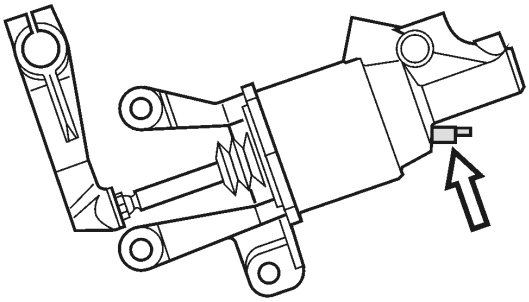
- Check that no oil or water leakage occurs in the oil cooler.
- Check that there is no leakage of oil or coolant from the connecting pipes or hoses on the oil cooler and gearbox, and check that the pipe connections and hoses are secure.
- If leakage, check the oil level.

71 Check ventilation for gearbox, transfer gearbox and PTO

1

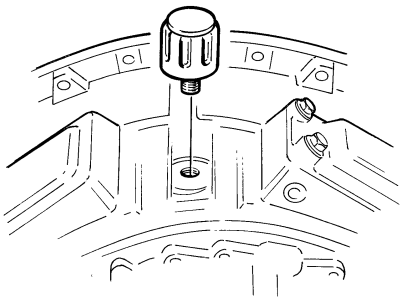


- Check that the ventilation for the gearbox and clutch servo is not blocked.



T1008227

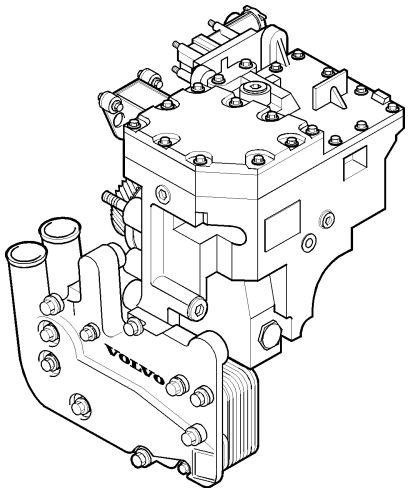
- Check that the ventilation for the PTO or the transfer gearbox is not blocked.



T4006171

- For information on service intervals for ventilation filter on automatic gearboxes, see Service Information group 175.

Note: If the ventilation filter is to be replaced, clean round ventilation filter first before removing to prevent dirt getting into the gearbox. Please refer to **Additional measures op. no. 43705–3**.



T0008639

72 Check retarder sealing and check cables

1

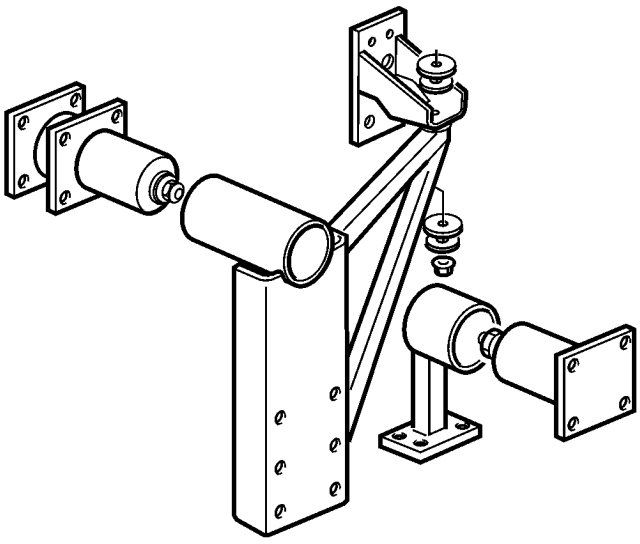
- Check that no oil leakage or coolant leakage occurs from the retarder.
- Check that there is no leakage of coolant from hoses or pipe connections between the engine and the retarder, and that the hoses and pipe connections are secure.
- If leakage, check the oil level.
- Check that there is no air leakage from the retarder compressed air system.
- Check that electrical connections, electric cables and compressed air connections on the retarder are secure and not chafing.

73 Check sound baffle for gearbox

1

- Check that the sound baffle is in good condition and not damaged.
- Check that the attachments for the sound baffle are complete.
- Where appropriate fit loose sound baffle under the gearbox.

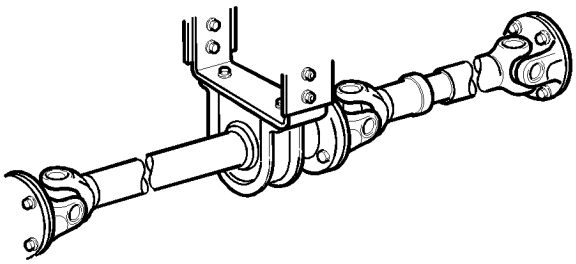
74 Check transfer gearbox mounting



T1008228

1

- Check that the transfer gearbox mounting brackets are intact.
- Visually check that bolt unions are not loose.
- Check that the mounting’s rubber bushings and rubber pads are tensioned.



T1006745

75 Check propeller shafts – universal joints, sliding joints and support bearings

1

- With the transmission in neutral, check the propeller shafts for straightness and damage.
- Feel each universal joint and check for wear. The joints should not have any slack.
- Make a visual check that the screws for the bearings and flanges are tight and that all circlips are in place.
- If the propeller shaft is to be lubricated, lubricate all points according to the lubricating chart.
- Turn and lift the spline joints and check for wear.

Side and top wear in the booms might cause movement in the sliding joints, which would cause vibration and unbalance. There is no hard and fast measurement for this play, but it should be considered and noted, so that the situation is pointed out to the customer.

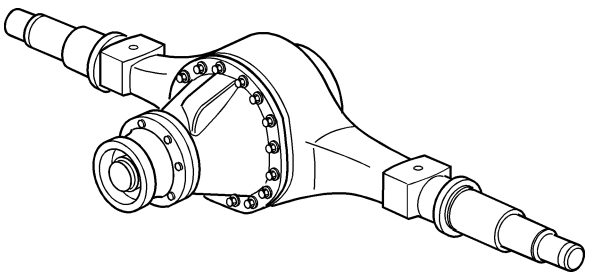
- Check the support bearing anchorage attachment and the condition of the rubber blocks. There should be no play between the rubber and the holder.

76 Check sealing of rear axle and hub reduction gear

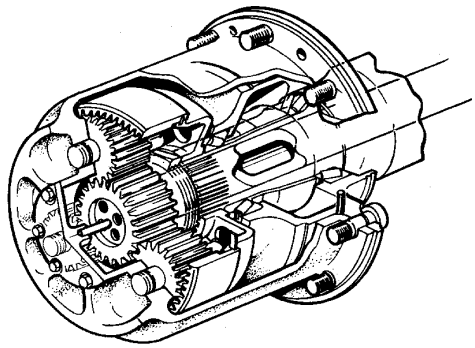
1

- Check that the rear axle does not leak oil.

The outlet from the rear axle ventilation hose may give off a certain amount of oil mist, which is normal.



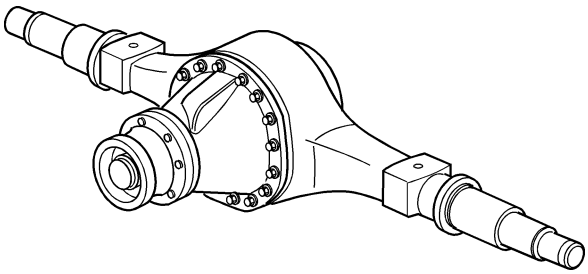
T4012341



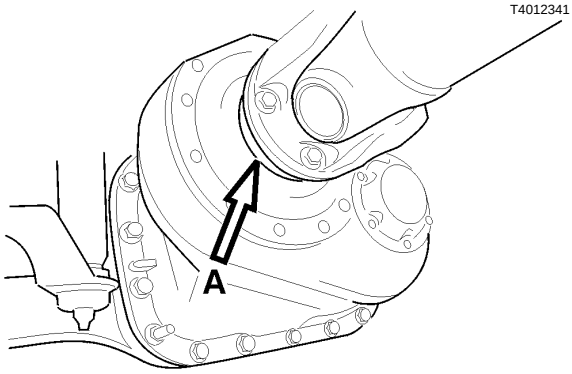
T4011521

- Check that the hub reduction gear does not leak oil.
- Check that the air vent hose is not plugged.
- If leakage, check the oil level.

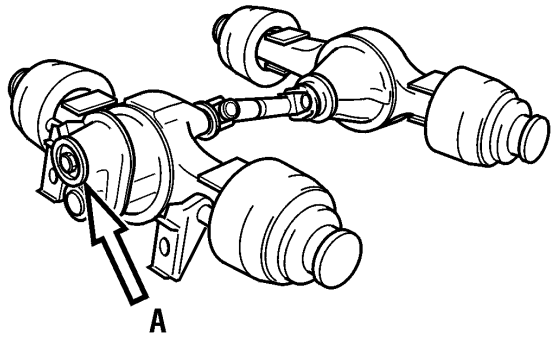
77 Check bearing clearance in the pinion and rear axle input shaft



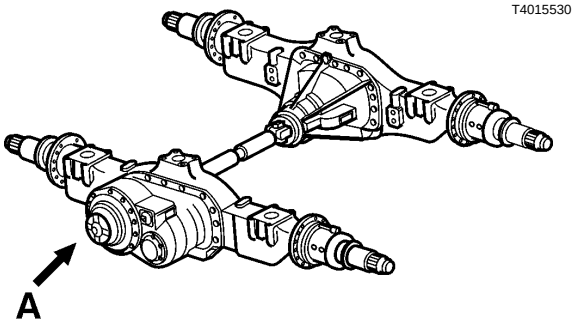
T4012341



T4015836



T4015530



T1008203

1

- **4×2, 6×2 and 8×2 rear axle and trailing rear axle for 6×4, 6×6 and 8×4** Check that there is no play in the pinion gear by lifting the final drive flange. The pinion bearing should have a certain pre-load. **Any movement indicates a loose nut or a loose bearing.**
- **4×4, rear axle RS1365HV**

1 The rear axle has an end float on the input shaft for the final drive (A).

2 Check the end float on the input shaft for the final drive (A).

3 The end float on the input shaft for the final drive must be adjusted if it exceeds **0.2 mm**.

- **Forward rear axle for 6×4, 6×6 and 8×4**

Note: 6×4, 6×6 and 8×4 have end float on the input shaft (A) for the transfer differential, i.e. the forward final drive.

Because of the end float, a 6×4, 6×6 or 8×4 vehicle can display radial play without necessarily having any adverse effect on the transfer gear. During rotation, the shaft is balanced, so the play is not so noticeable.

CTEV87, CTN372, and CTN472

1 Check the end float on the input shaft (A) for the transfer differential.

2 The end float on the input shaft must be adjusted if it exceeds 0.3 mm.

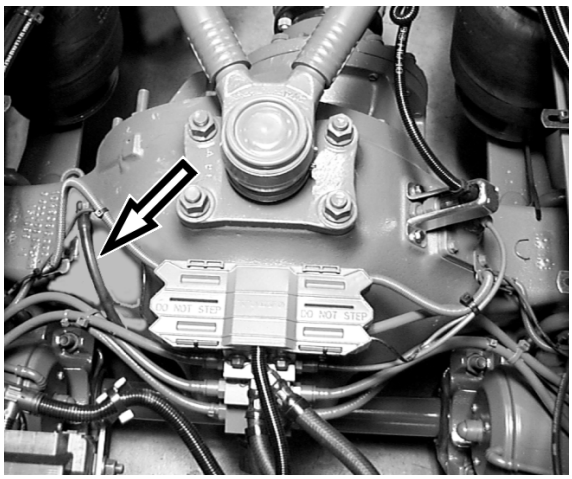
RT2610HV, RTH2610B, RT3210HV and RTS2370A

1 Check the end float on the input shaft for the forward rear axle (A).

2 The end float on the input shaft for the final drive must be adjusted if it exceeds 0.2 mm.

During any inspection or adjustment of input shaft end float, use service information group 46 as an aid.

78 Check rear axle ventilation

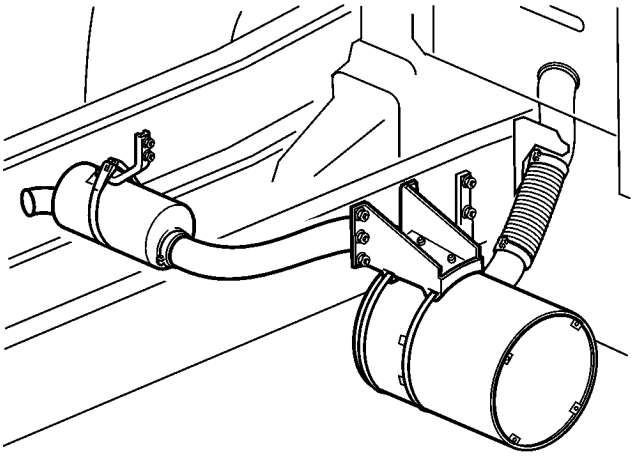


T1007386

1

- Check that the rear axle breather is not blocked.
- Check that the breather hose is securely fixed to the nipple.
- If the breather hose is drawn up into the chassis, check that the hose is intact, not pinched and that the mounting clamps are intact.

79 Check exhaust pipe and silencer or particulate filter



T1008198

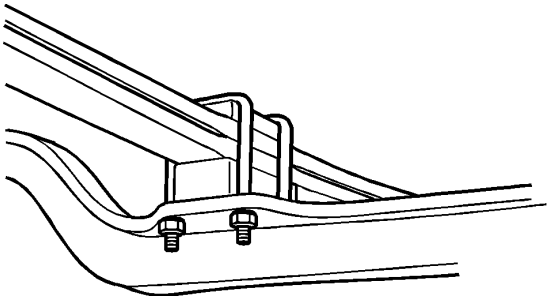
1

Note: Vehicle equipped with particulate filter: If, depending on the service interval of the particulate filter, the filter is to be cleaned, see **Additional measures, op. no. 25426-2**.

- Check the condition of the sheet metal in the exhaust pipe and silencer or particulate filter, if the vehicle has one.
- Check the flexible hoses and clamps.
- Check the mountings of the exhaust pipe and silencer or particulate filter for cracks, loose screws, clamps, brackets and protective plates.

For information about the particulate filter service interval, please refer to the service information “Lubrication service and oil changes” group 175.

80 Check springs and U-bolts



T1006450

1

- Check the springs for broken or spread leaves, which could indicate that the centre bolt is broken.
- Check the u-bolts. Loose u-bolts are indicated when the spring package is not completely pressed together and/or the spring package has moved on the axle by the anchorage.

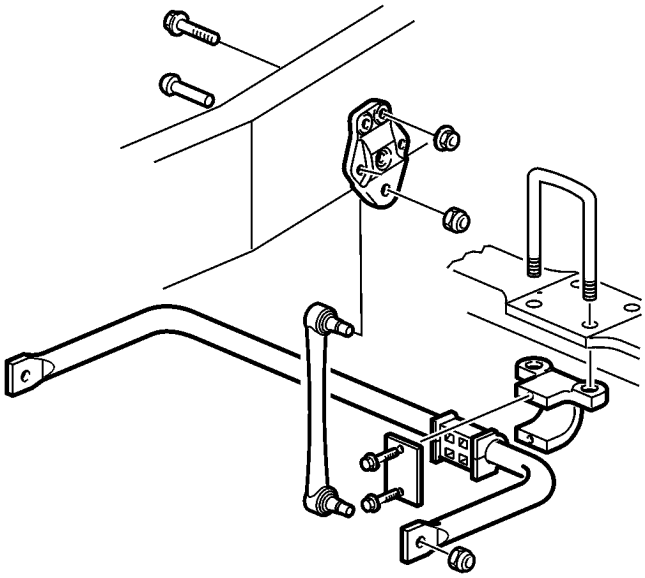
81 Check anti-roll bar

1

- Check the anti–roll bar bushes. Rubber bushes must not have any play and plastic bushes must not have radial play greater than **2 mm**.

The front end anti-roll bar is mounted on plastic bushes whereas the rear end can have either plastic or rubber bushes.

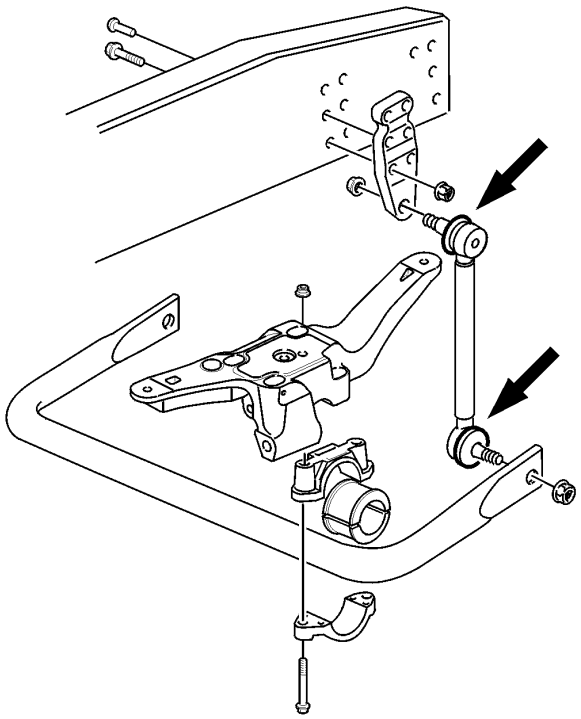
- Check that attachments for the anti-roll bars are not loose or cracked. Rust can indicate loose bolts or loose attachments.



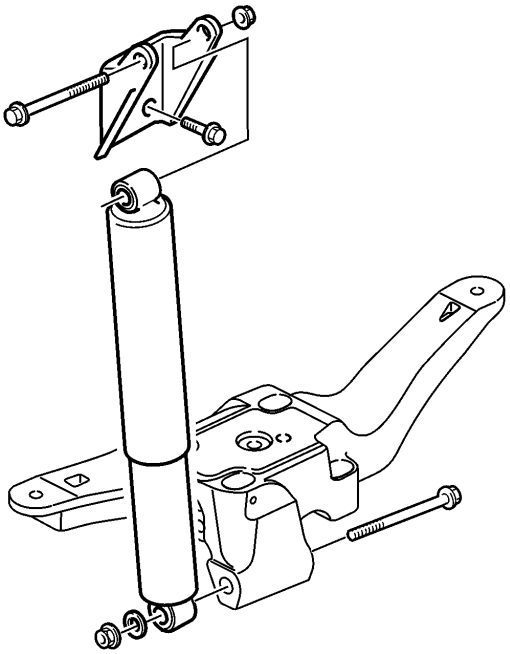
T1008229

- Check that the rubber bellows on ball joints on the shackle between the chassis anchorage and anti-roll bar are not damaged or split.

Note: The ball joints wear down rapidly if the bellows are damaged or cracked.



T1007062

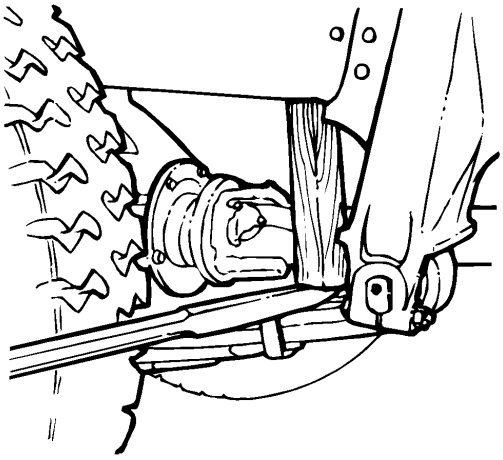


T1008217

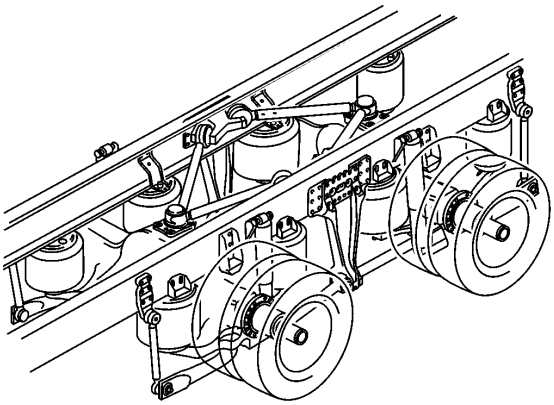
82 Check rear shock absorbers

1

- Check the rubber bushings.
- Check that the shock absorber attachments are secure.
- Check that the shock absorber brackets are in good condition and that they are secure.
- Check if there is any oil leakage from the shock absorbers and make a note if there is.



T1006508



T9007897

83 Check front and rear axle suspension

1

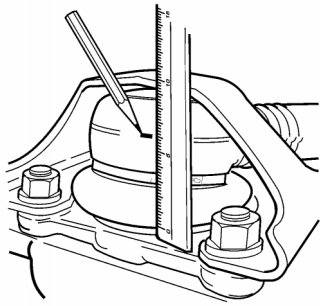
- Check the play in the **spring bolts** with a bar. **Max. permitted radial clearance** in spring bolt/bushing is **5 mm**.

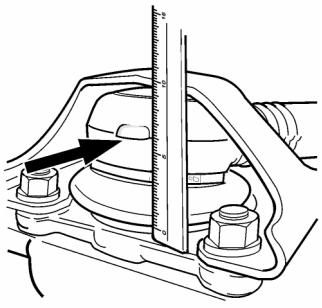
Rubber housed spring boltsNo axial or radial play. The rubber housing gives somewhat when checked, which must not be confused with play.

- Check wear between the spring and bracket for progressive spring, that the bracket is not worn.
- Check that the spring attachments are secure and that there are no cracks. The spring bolt should not have any play in the spring attachment.
- Check the roller in the connection of the balance arm to the spring, that there is no play in the roller bearing and that the roller does not bind.
- Check that the rubber hole springs are in good condition and secure.
- Check that the rubber springs in the ends of the rear springs are intact and secure (vehicles 6×4, 6×6 and 8×4).
- Check that the attachments for cross stay, reaction rod and V-stay are secure and that there are no cracks in the attachment devices or rods. Check that there is no play in ball joints and bushings.

- **Check for play at the V-stay.**

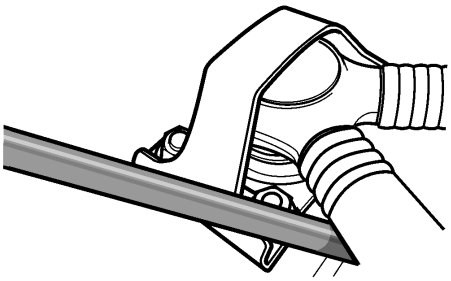
Note: The parking brake shall not be applied. The vehicle shall be in driving position. Chock a wheel so that the vehicle cannot start to roll.





Mark the V-stay, or measure to the lug if there is one; see fig. Use a crow bar and check that the axial movement does not exceed 1.5 millimetres.

Note: Use the crow bar as in the figure, and not in any other position because of the risk of damaging the rubber seals on the V-stay.

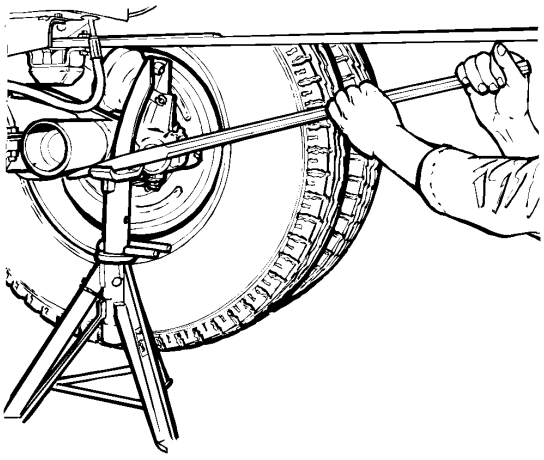


T7009912

If the axial movement exceeds 1.5 mm, the V-stay must be overhauled or replaced.

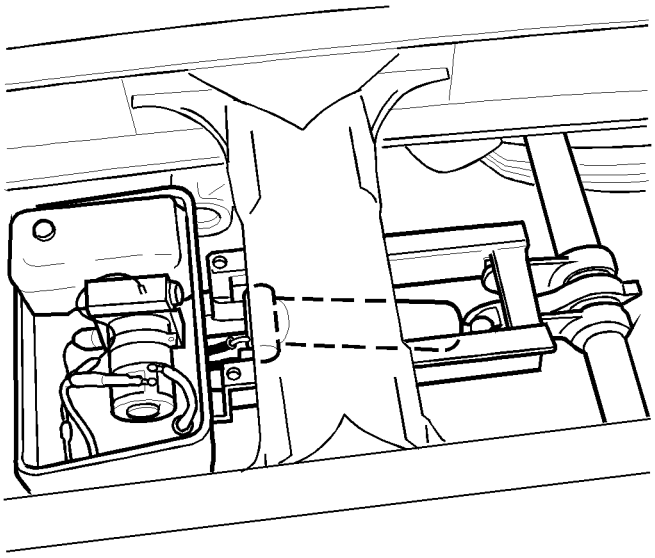
On vehicles where it is possible, measure using a dial indicator 9808092 and magnetic stand 9812528.

- Make a visual inspection of the V-stay's rubber bellows for damage or splits. If the bellows are damaged or split, the V-stay must be replaced.
- Check that clamps and attachments for the axle attachments and air spring members are not loose.
- Check that the attachments for the air springs are secure and that there are no cracks.
- Check that there is no play in the balance arm bearings (6x2, 8x2), neither radially nor axially.
- Check if the spring cradle (6×4, 6×6 and 8×4) shows any sign of wear in the bearing.
- Check for wear in the attachments and clamp unions for the mountings and stays. Rust can indicate that unions or attachments are loose.



T1006510

9808092, 9812528

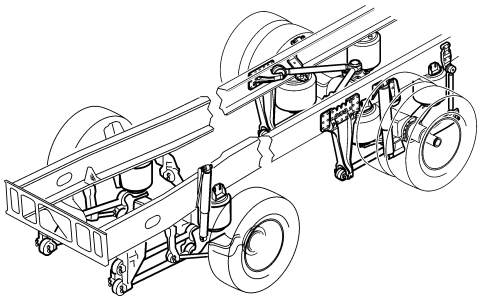


T1006418

84 Check bogie lift

1

- Check that there is no oil leakage from the hydraulic cylinder, pump section, pipe fittings or hydraulic hoses.
- Check the condition of the mechanical section, i.e. that there are no loose bolts, locks or cracks.
- Check attachments for the hydraulic cylinder.
- Check that the rollers on the levers are not stuck.
- Check air bellows and attachments for bogie lift on vehicles with air suspension, that there is no damage, cracks, loose screws or air leaks.

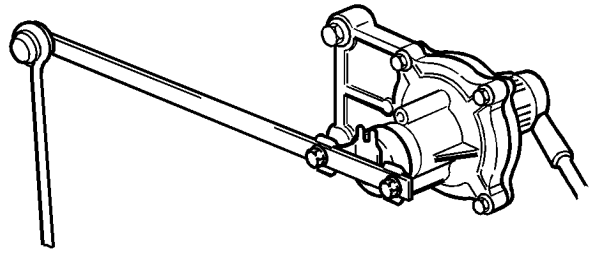


T1007419

85 Check air bellows and level sensors for air suspension

1

- Check that the air bellows do not leak.
- Check that the air bellows are undamaged.



T7007906

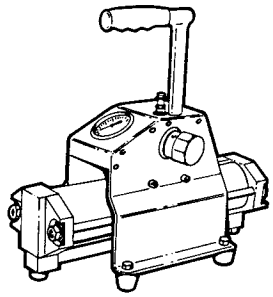
- Check that the level sensors are not damaged and that the electrical connections are secure.
- Check that levers and control rods for the level sensor are secure and there is no play or damage.

86 Check height regulation for air suspension

1

- Use the vehicle’s instruction book as a guide.

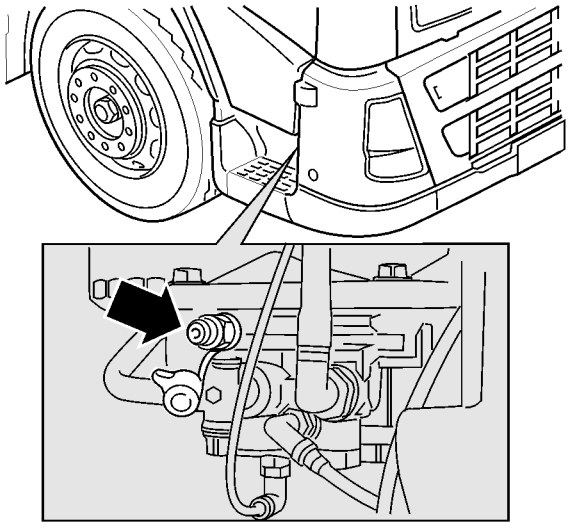
The compressed air system must be charged. As an alternative to filling the system by starting the engine, pressure booster 9810621 can be used.



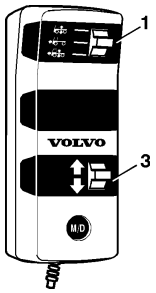
9810621

If the pneumatic system is charged from an external source of compressed air, it should be done through the air drier charging nipple to prevent moisture entering the pneumatic system.

- Turn the starter key to drive position.

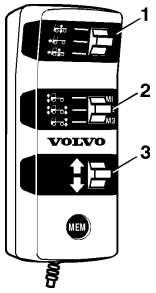


T1007733



T7007943

Control unit for vehicle with air suspension **rear only**.



T7007942

Control unit for vehicle with air suspension **front and rear**.

- Check with the control box that the vehicle can be raised and lowered manually. Check the front end and rear end separately, and then the whole vehicle in stages. Check that the vehicle stops in the set position in between each time it is raised and lowered.
- Check that no damage is visible on the bellows during raising and lowering.
- Raise the vehicle to the highest point and check that the reaction rod does not make contact with any members.
- Set the switch on the control box to drive position and note that the vehicle goes into drive position and stops there.
- Turn the starter key to 0 position.

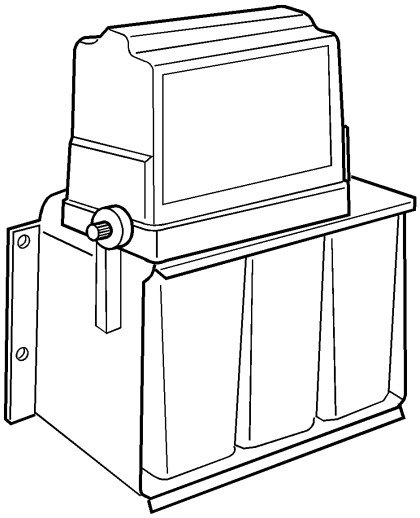
Use service information group 7 as a guide if the air suspension system needs adjusting or repairing.

87 Check chassis frame and crossmembers

1

- Check frame members and cross members visually for cracks and distortion.
- Visually check that there are no loose bolts or rivets.

88 Check lubrication system (central lubrication)



T9007322

1

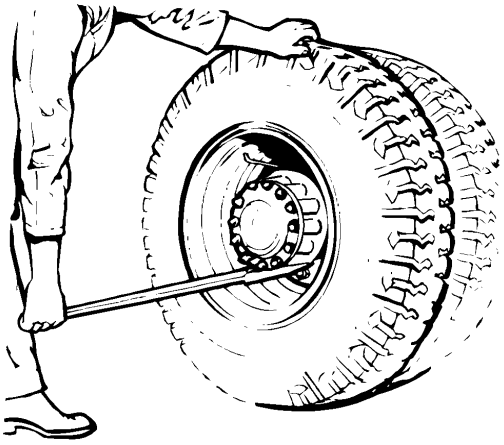
- Check that the pump unit, hoses, nipples and distribution valves for the central lubrication system seal correctly, are intact and firmly mounted. Also check that no clamps are loose.
- Check that no nipple or hose has come loose or has been damaged at any lubrication point.
- Check that no hoses have been chafed or have come undone at the front axle (because of large movements in the steering gear).
- Check that no lubrication point connected to the central lubrication system is un-lubricated (dry). If any lubrication point is not lubricated, action must be taken immediately.

89 Check compressed air lines and hoses

1
The compressed air system must be charged.

- Check compressed air lines and hoses for air leaks, chafing, cracks and any external damage.
- Check that hoses near wheels and axles do not chafe during spring travel and steering.

90 Check rear wheel bearings



T1006509

1
The rear of the vehicle must be raised and supported and the parking brake must be released during the check.

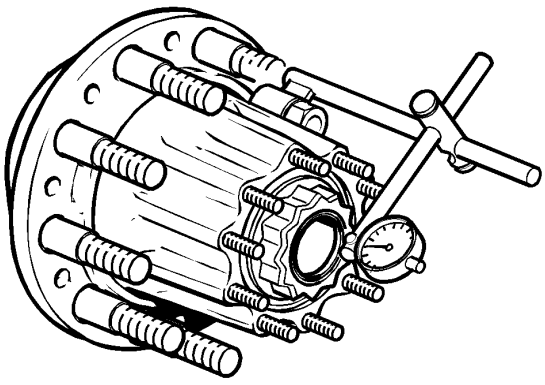
- Check rear wheel bearing play by lifting with a lever in the wheel hole. The bearing should normally be preloaded so there should not be any noticeable play in the wheel bearings.

Nevertheless, in certain cases a bearing play of up to **0.1 mm** can be allowed.
If there is play in the bearings, **the bearing play should be checked with a dial gauge.**

Note: Note the bearing clearance!

1 If the bearing clearance is less than 0.1 mm: spin the wheel with a wheel spinner. The half shaft must be removed on drive wheel hubs. Listen for abnormal noise in the bearings during rotation.

Trailing wheel bearings or pusher wheel bearings should always be checked with a wheel spinner.
Note: Note on the sheet any noise from the rear wheel bearings.



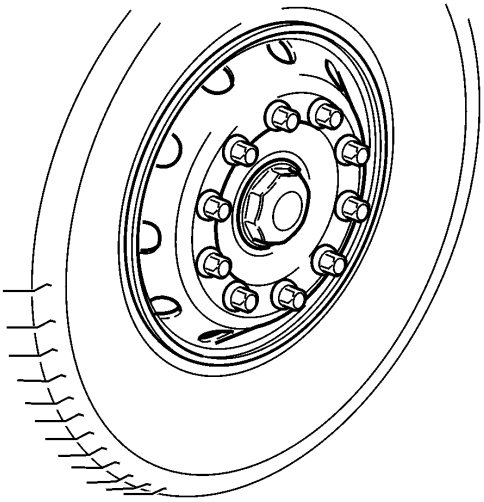
T1006701

Abnormal noise in the bearings is a sign of bearing wear. Hubs with bearings should therefore be replaced to avoid damage to the bearings.

2 If the bearing play is 0.2 mm or more, the hub with bearings must be replaced immediately to avoid future damage to the bearings.

Note: The bearing clearance cannot be adjusted.

For work procedures on hubs, use service information group 7, as a guide.



T1008222

91 Check rear wheels

1
Disc wheel

- Check the wheels for cracks and rust that can indicate loose nuts or broken wheel bolts.

Spoke wheel

- Check that all the wheel nuts and retainers are in place.
- Check that the fitting is correct and that the wheel is centred.

92 Check brake linings

Drum brakes

T1006743

1

- Check the brake lining thickness through the inspection holes in the backing plates.

Minimum permissible brake lining thickness is **5 mm**.

- Check that there is no grease leaking from the hubs onto the brake linings.

Note: Note the brake lining thickness in the report!

Use service information group 5 as an aid during any service work on the brake system.

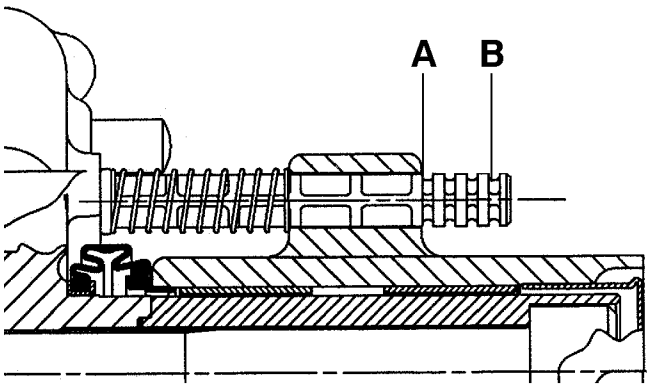
Disc brakes

The brake calipers for disc brakes are equipped with two wear sensors, one mechanical and one electric.

The electric wear sensor shows the average lining wear on the pair of brake pads.

The PC tool can be used to read the stored value of remaining brake pads as a percentage for each wheel.

The mechanical wear sensor shows the lining wear on the outer brake pads.
Check brake lining wear, mechanical wear sensor.

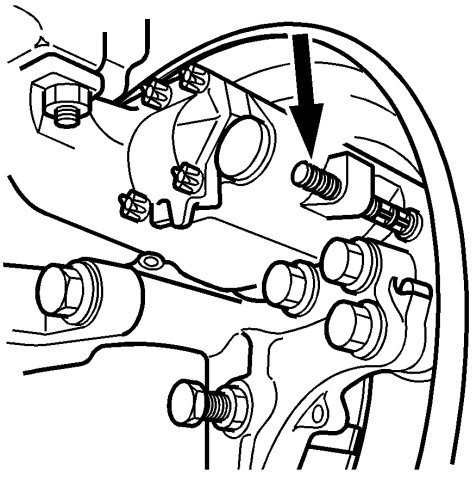


T5011027

A. New brake pads, lining thickness 20 mm.

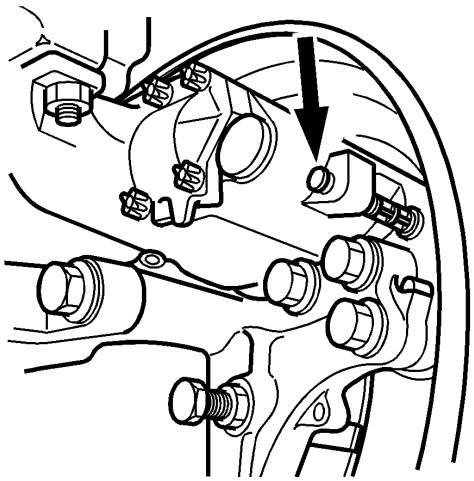
B. Change limit, lining thickness 4 mm.

- Check the thickness of the brake pads by means of the mechanical wear sensor located on the brake callipers. The mechanical wear sensor gives a rough indication of the brake pad thickness; it works on the assumption that the inner and outer pads wear equally.



T1007722

The figure shows the mechanical wear sensor's position with new brake pads and with pads **20 mm** thick.



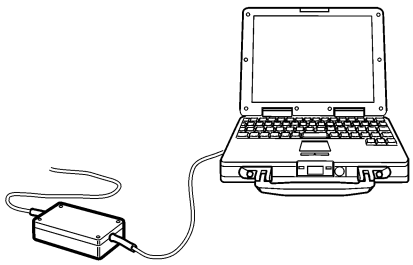
T1007723

- Check that the wear sensor is not stuck and can move freely.
- Measure the projecting portion of the mechanical wear sensor to get an estimate of the brake pad thickness.

Minimum permissible brake pad thickness is **4 mm**.

Note: Note the brake lining thickness in the report!
The illustration shows the position of the wear sensor for worn brake linings, approx. **4 mm** left on the brake lining.

Use service information group 5 as an aid when doing any work on the disc brakes.

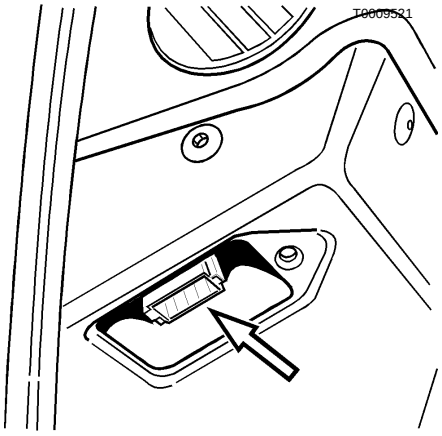


T0009521

Check brake lining wear with the PC tool

The PC tool can be used to read the stored average value of each pair of brake pads as a percentage for each wheel.

- Connect the PC tool to the data link connector on the vehicle, which is located on the driver's side underneath the instrument panel.



T3008754

- Use the PC tool to read the stored average value for remaining brake lining thickness on each wheel. With a value of 20% the brake lining is approx. **4 mm**, which is the minimum permitted thickness.

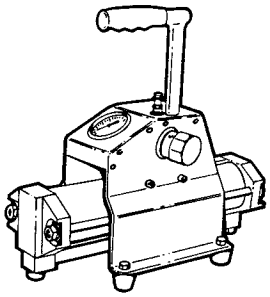
Note: Note the brake lining thickness in the report!
If the lining wear on one wheel differs from the average, the reason must be investigated.

Use service information group 03 and group 5 as an aid when checking brake lining wear and during any work on the disc brakes.

93 Check brake cylinders, levers and forks

1

- The compressed air system must be charged. An alternative to filling the system by starting the engine is to use pressure booster 9810621.

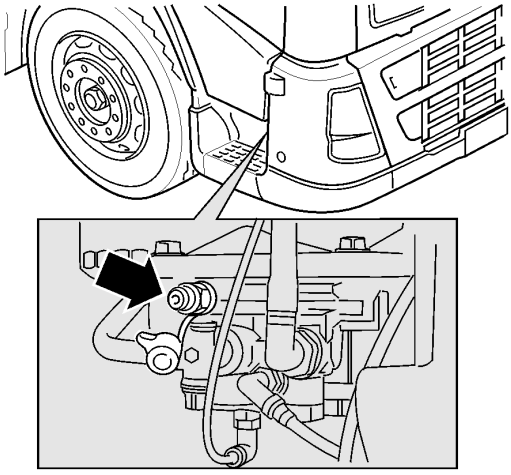


9810621

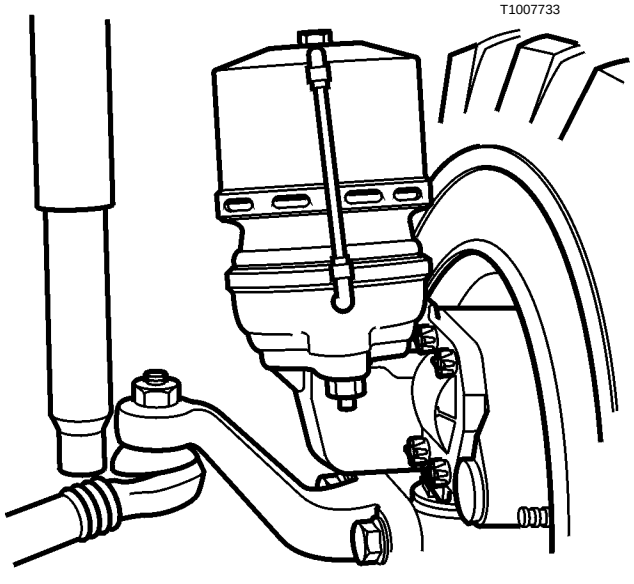
If the compressed air system is filled from an external source, it should always be filled through the air drier filler nipple to avoid moisture entering into the compressed air system.

The wheels must be blocked so that the vehicle cannot start to move.

- Undo the handbrake and apply the foot brake, using a pedal jack or an assistant.
- Check that the brake cylinder seals correctly.



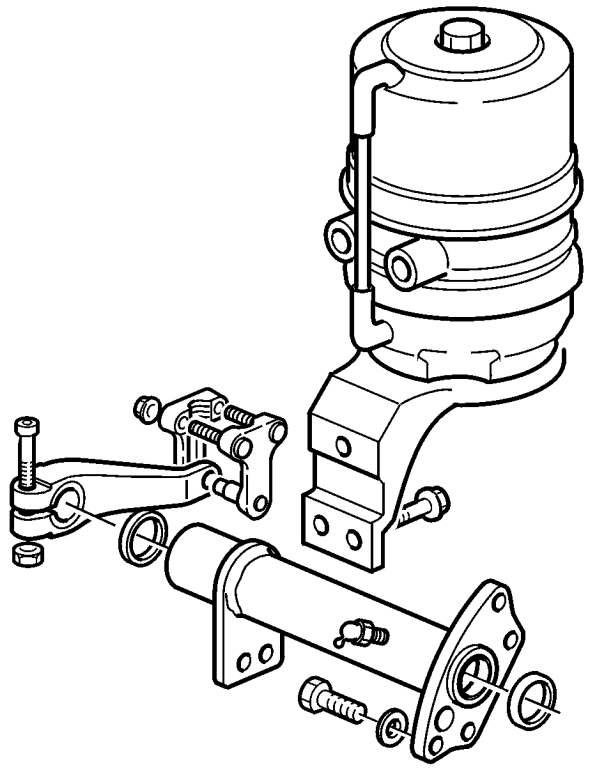
T1007733



T0008508

- Check that the brake cylinders and brake anchorages are firmly fastened and that there are no cracks.

- Check that the brake levers and brake forks are undamaged.

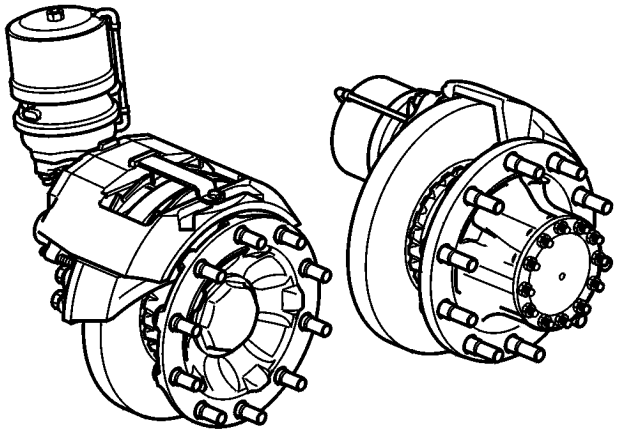


T1008202

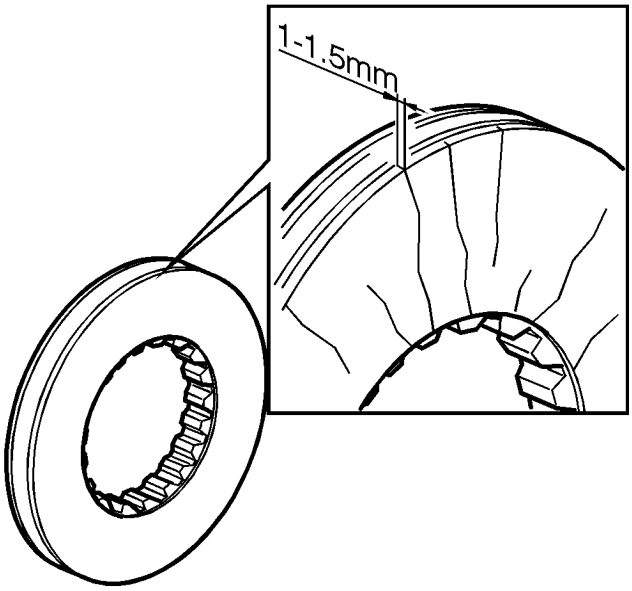
94 Check brake calipers and brake discs

1

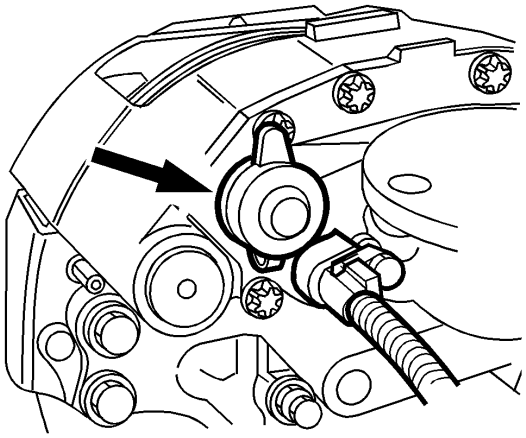
- Check brake caliper condition for damage, corrosion, and make sure the calipers are securely attached.



T5011015



T5011102



T1007724

- Check brake disc condition with respect to wear, cracks and scoring.

On axles where the protecting plate covers the brake discs:

1 Check the edges of the brake discs to see that there are no cracks

2 Also check the condition of the brake discs through the ventilation gaps in the protecting plates.

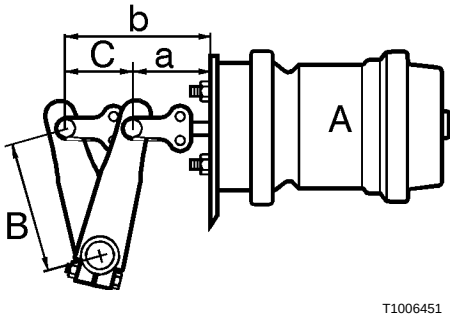
3 On axles with single wheels, check the condition of the brake discs through the holes in the wheel rims.

- Check that the electric cables for the sensor in the brake calipers and brake anchorages are clamped and undamaged.
-

Check that the protective caps for brake adjustment are undamaged and correctly located.

- Check that there is no grease leakage from the hubs, this can affect the brake discs and brake pads.

If there is any doubt about brake component condition or function, and brake disc wear, cracks and minimum dimensions, please refer to the service information group 5.



95 Check brake lever travel

1
The function of the automatic adjustment mechanism is checked by measuring the brake lever travel **C**.

This check is carried out with a brake pressure of **6 bar**.

The wheels should be blocked, so that the vehicle cannot start to move.

- Release the parking brake and apply the foot brake using a pedal jack or an assistant.
- Measure distance **b**.
- Release the foot brake and measure distance **a**.
- Calculate the travel **C** (C=b-a).

Note: Note the values in the report!

The brake lever travel C must not exceed **51 mm at 6 bar** and automatic adjustment. Minimum permitted travel at 6 bar is **17 mm**. The difference in travel on the same axle must not exceed **5 mm**.

Nominal values for travel with automatic adjustment

A	B	C
16	125	30
20	125	30
24	155	40
24	170	45
27	170	45
30	155	45

A = brake cylinder size in square inches.

B = brake lever length in mm.

C = nominal value of lever travel in mm (with cold brakes).

Note. Slightly greater travel can occur without there being anything wrong with the automatic adjuster.

Correct travel indicates that the automatic adjuster is working correctly.

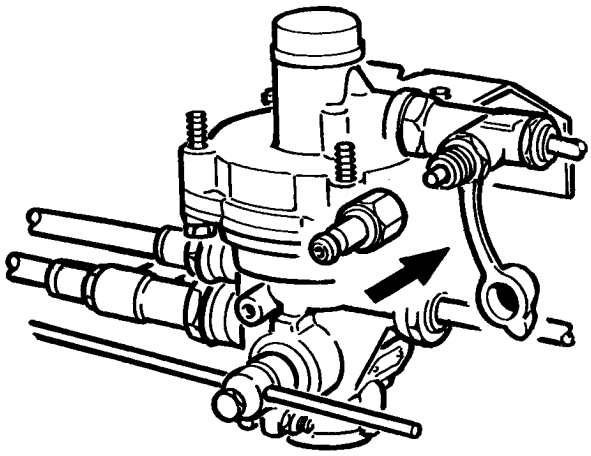
Check brake lever travel without automatic adjustment

On vehicles without automatic adjustment, the following values apply during adjustment at 6 bar:	
Lever length (B)	Travel (C)
125/155 mm	25 -30 mm
170 mm	35 -40 mm

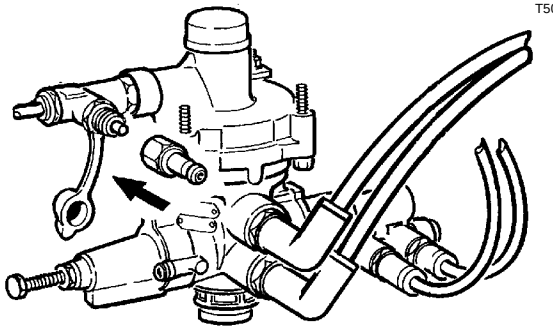
96 Check load sensing valve and axle load sensor

1

- Check the screw connections on the valve.

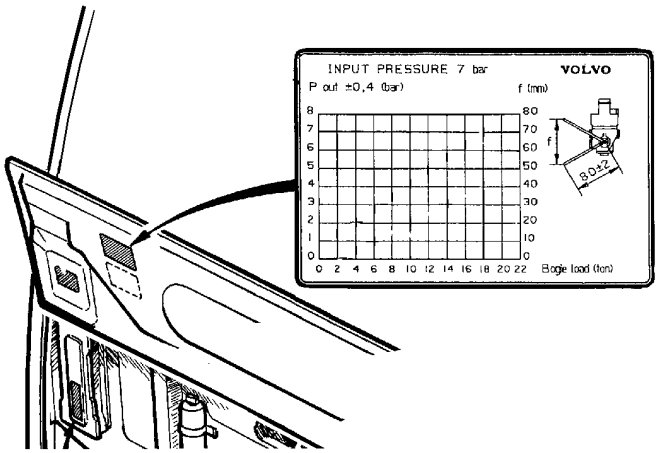


T5007077



- Check the condition of the link system spring, wire and valve brace.
- Check that the valve is not sticking by operating the lever.

T1006801

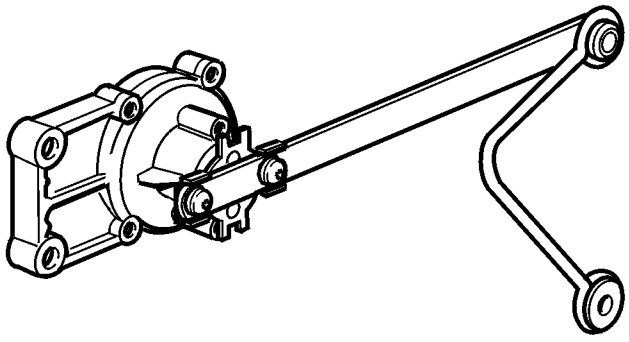


- Check that the adjustment of the load sensing valve corresponds with the adjustment diagram.

Axle load sensor on rear axle of vehicle with leaf suspension and disc brakes:

- Check that the axle load sensor is not damaged and that the electrical connections are secure.

T5007081



- Check that the lever and control rod for the axle load sensor are secure and there is no play or damage.

For checking and adjustment of load sensing valves, see service information group 56.

T5012040

Road test

Refers to a short distance and only to verify certain noted assessments.

Note: Use the User Manual for each vehicle as a guide.

97 Check after start

1

- Check that the position of the steering wheel can be adjusted in height and in length. Check that the steering wheel is locked in the set position.
- Check that the warning lamps, indication lamps and instruments function.
- The oil pressure and charge warning lamps should go out as soon as the engine is started. Check that the engine oil pressure gauge shows oil pressure.
- The symbol or warning lamp for low coolant should be extinguished.
- The symbol or warning lamp for cab locking should go out, which indicates that the cab is properly locked.
- The warning lamp for the pusher axle and trailing wheel axle hydraulic steering system should go out.
- Warning lamps for service brakes should be extinguished when the compressed air system is charged.
- The parking brake warning lamp should go on when the parking brake is applied.
- The check lamp for anti-lock brakes (ABS) should light up.
- Check the centring function of the hydraulically steered pusher axle or hydraulically steered trailing wheel axle:

  1 Turn the wheels to one side (front axle, pusher axle or trailing wheel axle wheels).

  2 Switch off the engine.

  3 Turn the ignition key to the start position, and check at the same time that the pusher axle or trailing wheel axle wheels do a centring movement.

When the front axle wheels are turned to the straight ahead position, the pusher axle or trailing wheel axle wheels will start to turn in the opposite direction. When the front axle wheels approach the straight ahead position, the pusher axle or trailing wheel axle wheels will centre. After this, the steering lock of the two axles will track each other.

Note: The centring function is a safety function and should always be checked. If you are not sure about the centring function of the pusher axle or the trailing wheel axle, see Service Information group 6.

T3014466

T3014402

Note: The information lamp and the symbol which warns of low air pressure in the air suspension system should be on when driving.

Note: Never start driving as long as the warning lamps for the brake system or the warning lamp for the parking brakes are lit.

98 Check during road test

1

- Ensure that the speedometer/tachograph, odometer and other instruments are in working order.
- The brake system air pressure gauges should be within the limits for normal values.
- Check that the vehicle can be steered satisfactorily and without imbalance.
- Check that the brakes function correctly and do not pull to one side or grab.
- Check that the exhaust brake is working correctly.

Note: On the D12 engine, the engine must be warmed up before the VEB (Volvo Engine Brake) will work.

- Check that the retarder functions correctly. Apply the retarder cautiously.
  If the oil has been changed in the compact retarder, drive at an approximate speed of 50 km/h. Apply the retarder 5 times at position 2 for about 5 seconds each time.
- Listen and attempt to assess whether there is any exhaust leakage during loading.
- Check that the control lamp for anti-lock brakes (ABS) goes out. If the lamp does not go out, or goes out and then lights up again, there is a fault in the system.
- Check that the symbol or the warning light for the blocked air cleaner does not light up when driving.
- Check that the clutch and gearbox, manual or automatic, function correctly.
- Check that the differential locks and engagement of front wheel drive, plus the appropriate indication lamps function correctly.
- Check that the instrument display does not show any error codes for Powertronic/Geartronic/I-shift gearbox. If there is a fault, note the error codes!
- Check that the engine has the correct working temperature (at least 75°C).
- Check that the heating system and climate unit function.
- Check when driving that the windscreen wiper functions and that the swept area is correct.
- Check when driving that the windscreen washer functions and that the jets are correctly aimed.

99 Check after road test

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- Check parking brake application by attempting to let the truck pull away gently with the parking brake applied.
- Check that the power take-off re-engagement interlock functions. If the engine is shut off with the power take-off engaged, the power take-off is disengaged. When the engine is restarted, the power take-off is disengaged although the switch is in the on position.
- Listen for abnormal sounds from the engine bay.
- Check that the exhaust pipe and silencer joints seal correctly.
- If the vehicle is fitted with an automatic gearbox a final check of the oil level should be made when the gearbox is warm after the test drive.
    - Apply the parking brake.
    - Put the gear selector in neutral with the engine running at about **1000 rpm**.
    - Wipe the dipstick on a clean lint-free paper.
    - Check the oil level on the dipstick.
    - Drain off or top up with new oil if necessary. Be especially careful with the cleanliness of the oil. **Dirt in the oil can damage the gearbox.**
- Check the display to see that there are no error codes stored in the vehicle's control units. Use the appropriate service information to help rectify any error codes.
- Check that there is no oil or fluid leakage.

100 Finish

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- Wipe off handles, steering wheel and controls.
- Wipe off the floor matting.

Feedback

One of our objectives is that workshop personnel should have access to correct and appropriate service manuals where it concerns fault tracing, repairs and maintenance of Volvo vehicles.
In order to maintain the high standards of our literature, your opinions and experience when using this manual would be greatly appreciated.
If you have any comments or suggestions, make a copy of this page, write down your comments and send them to us, either via telefax or mailing directly to the address listed below.

To

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From

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Comments/proposals

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Concerns Service Manual: .....

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Volvo Truck Corporation

Göteborg, Sweden

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